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Reorganization of Lake Carriers' Association.

Detroit, Mich., Jan. 23.—The Lake Carriers' Association as a body incorporated under the laws of West Virginia, and thus fitted to undertake dealings, in so far as they may desire to do so, with labor organizations, is to be continued during the coming year. In other words, the plans of reorganization, upon which active members of the association have been at work for a long time past, have been adopted, and although there is still some doubt as to whether the big fleets of the Steel Corporation and J. C. Gilchrist of Cleveland will be represented in the new body, it is hoped that they will come in later on. Even if these two big fleets are not entered it is now more than probable that the change will be effected without them. It is confidently expected, however, that this will not be necessary; that the management of these vessels, seeing that all other interests are united, will give their co-operation. Neither Mr. A. B. Wolvin, manager of the Steel Corporation fleet, nor Mr. J. C. Gilchrist were present at the meeting. Of course the Steel Corporation has reason to deal very carefully with the labor problem and undoubtedly has a fixed policy on that score. Its lake fleet of vessels is only a small link in the great chain that is involved in this problem.

The opening session of the association was characterized by inertia. The members were slow in getting together and practically did nothing when they did assemble. The members did not want to even hear the report of the board of managers read and stopped Secretary Brown from reading it after he had scarcely begun. The report, however, had been previously printed and distributed to each member so that each might dip into it for himself. Capt. M. M. Drake moved that the representatives of the various labor organizations, having to do with lake traffic, who were in the city, be given twenty minutes each at the afternoon session to express their views. This was carried unanimously and a recess was taken until afternoon.

At the afternoon session, however, the labor representatives decided that their cause should be presented exclusively by Mr. D. J. Keefe, president of the International Longshoremen, Marine & Transport Workers' Association. His talk was, therefore, the feature of the afternoon session and a straightforward, practical, excellent talk it was. In his preface he stated that he was not prepared to speak for the seamen, so called, or for the marine engineers, but that he spoke solely for the longshoremen, for the marine firemen, oilers and water tenders, and for the grain scoopers of Buffalo.

Mr. Wm. Livingstone.

"My object in speaking for the grain scoopers," said he, plunging directly into his talk, "is largely for the purpose of trying to have our understanding in the future with the committee of the Lake Carriers' Association and not with the superintendent. Don't misunderstand—our relations with Supt. Kennedy have always been of the pleasantest character. Yet at the last meeting of the Lake Carriers we were somewhat handicapped with Supt. Kennedy. He stated that the committee had instructed him that only such and such conditions should be complied with and that if other conditions were insisted upon the whole subject would have to be referred back to the committee. We desire that the wage scale and other conditions shall be settled between us and the committee. In meeting with you we have always had unlimited power to make the best terms for the men that we possibly could make; we desire that the persons with whom we deal on your behalf shall have the same power. We do not desire a change in the system of handling grain as far as the superintendency is concerned. Our relations with Mr. Kennedy are perfectly cordial; but there are a great many details to be taken up and we believe that your representatives should have unlimited power to settle them. As regards the marine firemen we had in the past season for the first time in the history of the great lakes an understanding between the employer and this class of labor. Formerly the marine fireman had no voice whatever in the matter. His wage and his station were settled without consultation with him and he was expected to be content. Now we hold that if a worker has any right at all he has a right to be present at the making of a contract which he is supposed to carry out. I am proud to say that this right was recognized last spring and the Lake Carriers saw the advisability of meeting together to contract for work for a given period. I will admit that there was considerable violation of the agreement so entered into. It was violated by the men; but it was also violated by the employers. I am confident that when a new agreement is entered into with the firemen, oilers and water tenders that it will be fulfilled to the letter. It has been not unusual for a man to gradually rise from a lower position to that of mate, to master and eventually to that of owner; and masters were used to the old trend of cuffing the fellow under him. It is a satisfaction to know that there is less and less of this as the years go by.

"The time has come when the employer must deal with the worker. There is no alternative. The worker must be present when an agreement which he is expected to carry out is made. They must meet together so that the worker can feel that he is part and parcel of the business. The relations between workers and employers are more satisfactory today than ever. I have no doubt that the pleasantest relations will exist all round if the Lake Carriers will treat other branches of labor as well as they have treated the grain scoopers of Buffalo. All these things can be regulated if the Lake Carriers will meet with the workers through committees and I am confident that all agreements will be carried out both in letter and spirit.

"A short time ago we used to come to the conventions of the Lake Carriers and were unable to get a hearing. Could make no inroad on the score of dealings with the association. In fact we couldn't so much as squeeze a tooth pick in. But through constant effort and untiring labor there was an odd fellow among you who came eventually to the conclusion that we ought to have a hearing. I am glad to say that one of the first of these was Mr. J. G. Keith of Chicago. I feel confident that you are satisfied as to the results so far. We have kept our agreements as religiously as any business organization. Whenever a local body attempted to delay the progress of business or to interfere in any manner they were immediately notified to return to work.

"We ask that all agreements be made through committees, or if through the superintendent that his power be made as unlimited as ours. We cannot meet with committees who present ultimatums, for we have no ultimatums of our own to present.

"In conclusion, I beg to say that I hope the Lake Carriers' Association will continue in existence because we would prefer to deal with it than with individual interests. We will carry out our own agreements and we will help you to carry yours out."

At the conclusion of Mr. Keefe's remarks President Livingstone asked a couple of questions for the purpose of clearing away any possible misunderstandings and not for the purpose of casting any reflection whatever upon the previous conduct of any body. He said that as far as the Lake Carriers' Association was concerned it would carry out to the letter any contract into which it entered. He begged to ask if the labor organizations would do the same. Mr. Keefe replied that they would. President Livingstone begged further to ask that supposing a contract, harmonious to both parties, had been entered into and that one of the local bodies was not carrying it out as well as might be wished would the parent body take the matter up and compel the men to carry out the agreement.

"Is there an instance where it has not been carried out," replied Mr. Keefe. "The best answer to that question is to refer to the past. In the event of any violation on the part of a local body we will use our best endeavor to carry out the provisions of the agreement, even to the extent of sending men to take our own men's places."

This was deemed a most satisfactory reply. There was no further discussion upon the labor topic.

Capt. M. M. Drake of Buffalo presented the following series of resolutions upon the approaching semi-centennial anniversary of the breaking of ground for the first canal at Sault Ste. Marie and they were unanimously adopted.

"Whereas, on June 4, 1903 will occur the semi-centennial of the breaking of ground for the first canal at Sault Ste. Marie, Mich.;

"Whereas, no single act has served so much to advance the material prosperity of the United States as the construction of this canal;

"Whereas, passing through it may be observed the greatest volume of commerce known to the globe, a commerce which during 1902 amounted to 36,000,000 tons, of which 25,000,000 tons was iron ore;

"Whereas, without this abundance of ore and the cheapness of its transportation from the mine to the furnace the United States could not possibly have attained its premier position as a manufacturer of iron and steel;

"Whereas, resolutions are now pending in the house of representatives and senate of the United States to appropriate the sum of $50,000 to fittingly observe the approaching semi-centennial anniversary;

"Whereas, it is the judgment of the Lake Carriers' Association that the event is worthy of national observance;

"Resolved, that the Lake Carriers' Association hereby endorses the project and recommends its furtherance to all the lake representatives and senators,

"Resolved that a special committee be appointed by the chair to facilitate the passage of the necessary legislation in congress and to arrange for active participation in the celebration by the Lake Carriers' Association,

"Further, resolved that it is the sense of the association that a tablet in memory of Gen. O. M. Poe should be suitably inscribed and placed with appropriate ceremonies, upon the Poe lock, during the celebration. For the Lake Carriers' Association are deeply conscious of the debt which they owe, as vessel men, to Gen. O. M. Poe.

"Further resolved that the special committee be directed to prepare the appropriate sentiment to be inscribed upon the tablet."

MEMBERSHIP AND FINANCES OF THE ASSOCIATION.

The report of the board of managers, referred to above, and which deals very fully with affairs of the association during the past year, will be found in full on following pages. It shows that more than a million tons of vessel property was represented in the association during the past year. To be exact, the total number of vessels involved was 640 and their tonnage 1,014,066.

The report of Capt. Geo. P. McKay, treasurer, was printed as a part of the pamphlet containing the report of the board of managers and was distributed among the members. For the first time in several years the association has quite a large balance in its treasury. Balances have been carried over in previous years but the association has also had years when deficits were reported. This year the balance is $6,311.96. This favorable condition of the treasury is largely due to the government having relieved the vessel owners of much of the expense attached to the maintenance of private lights. It is due in part also to a surplus of collections from the vessels for the shoveling of grain at Buffalo, which surplus is regularly turned over to the association. Briefly the principal items of the treasurer's report are:

Receipts—From dues, $34,102.86; balance from 1901, $1,074.33; from grain shoveling fund, $2,800; from United States lighthouse board for maintaining private lights, $5,675; miscellaneous, $104.20; total, $43,756.39.

Disbursements—Salaries of officers, $6,400; salaries of shipping masters, $10,761.24; expenses of secretary and treasurer's offices, $169.14; expenses of shipping offices, $2,642.17; private lights, $4,355; miscellaneous, including maintenance of Southeast shoal light-ship, traveling expenses of committees and officers, etc., $13,116.88; balance in treasury, $6,311.96; total, $43,756.39.

THE REORGANIZATION PLAN.

It is taken up at the second day's session—One share of stock for every hundred tons entered—A board of directors of twenty-one with an executive committee of five.

While the members adjourned on Tuesday afternoon to meet again on Wednesday morning at 9 o'clock, it was fully 11 o'clock before they made any pretense whatever of meeting. And had it not been for the indefatigable Rumsey they would not have met then. But that strenuous gentleman never desisted from his picturesque exhibition of vocal pyrotechnics on the marble staircase of the Cadillac until the members began to file upstairs, one by one at first, then two by two, then in blocks of five and then in a common movement as the voice of the masculine siren became more vociferous and more persuasive. As soon as the meeting was called to order the association went into executive session with orders to the faithful Rumsey not to come in himself and not to permit anyone else to come in—instructions which he obeyed to the letter.

During the session Mr. Harvey D. Goulder, counsel for the association, read in detail and explained the plan to incorporate the association, in order to more adequately deal with the questions which it will have to meet in the future. The scope of this plan of incorporation will be found further along in this article. Briefly the incorporation is to be under the laws of West Virginia and the capital stock $20,000 at $1 per share value. Each member of the association is to hold one share for every 100 net tons of enrolled tonnage—that is, if a member has a vessel of 1,000 tons net, he will hold ten shares. The issue of stock at a nominal price, is of course, simply a necessary part of the general scheme of organization. The matter of dues for maintenance of the organization will be fixed, according to provision of the by-laws, by the directors. Mr. Goulder explained at length the advantages of incorporation, the substitution of a definite scheme of incorporation for one that is vague. He referred to the difficulties which the association had encountered in dealing with the grain shoveling question at Buffalo and to the need of incorporation if matters of that kind were to be rightly handled. Incorporation is the most convenient medium of dealing with business problems and managers of great enterprises are becoming more and more averse to having anything to do with bodies and associations which are practically partnerships and in which responsibilities, duties and liabilities are not accurately defined. Mr. Frank J. Firth and Mr. E. T. Evans of the Erie & Western Transit Co., spoke to the same tenor and heartily endorsed the plan. Other representatives of the Buffalo line boat interests were also in favor of the change. Mr. D. Sullivan, Mr. Helm and Mr. Waldo were not in favor of the reorganization, but upon its being more definitely outlined Mr. Waldo withdrew his objection. A rising vote was taken upon the question of taking up for consideration the details of the plan of charter, and it was carried overwhelmingly. Messrs. Sullivan and Helm voted against it, however. Upon being asked to define their objections they declined to do so. It was understood, however, that Mr. Sullivan was acting for the Steel Corporation in the absence of Mr. Wolvin and his opposition was taken to imply that the Steel Corporation was averse to pledging its support to a body which would, as an incorporation, have to deal directly with the problem of labor. In other words the ramifications of the Steel Corporation are such that it did not desire to do with one department of its operations what it might not like to do with another. Mr. Helm was understood to represent Mr. Wolvin personally through the Peavey fleet. There was no intimation at the meeting as to how the Gilchrist interests would act. After the rising vote had been taken, resulting as announced, an adjournment was taken until afternoon to discuss clause by clause the features of the plan of incorporation.

DISCUSSION OF CHARTER.

The entire afternoon session on Thursday was spent in discussing, clause by clause, the articles of incorporation as they had been read at the morning session. As it was evident that the charter, subject to amendments in detail, was to be adopted, and as Capt. Sullivan, presumably representing the Steel Corporation vessels, did not desire a tonnage vote, it became unnecessary to submit the general proposition of incorporating to any further vote. Consideration of the different clauses in the articles of incorporation, therefore, proceeded quite rapidly, and before adjournment they were adopted practically as read at the morning session. They were signed immediately by some twenty representatives of the largest interests at the meeting, including several of the line boat managers and most of the large so-called individual interests of Cleveland. Others announced their intention of signing as soon as they could communicate with home offices.

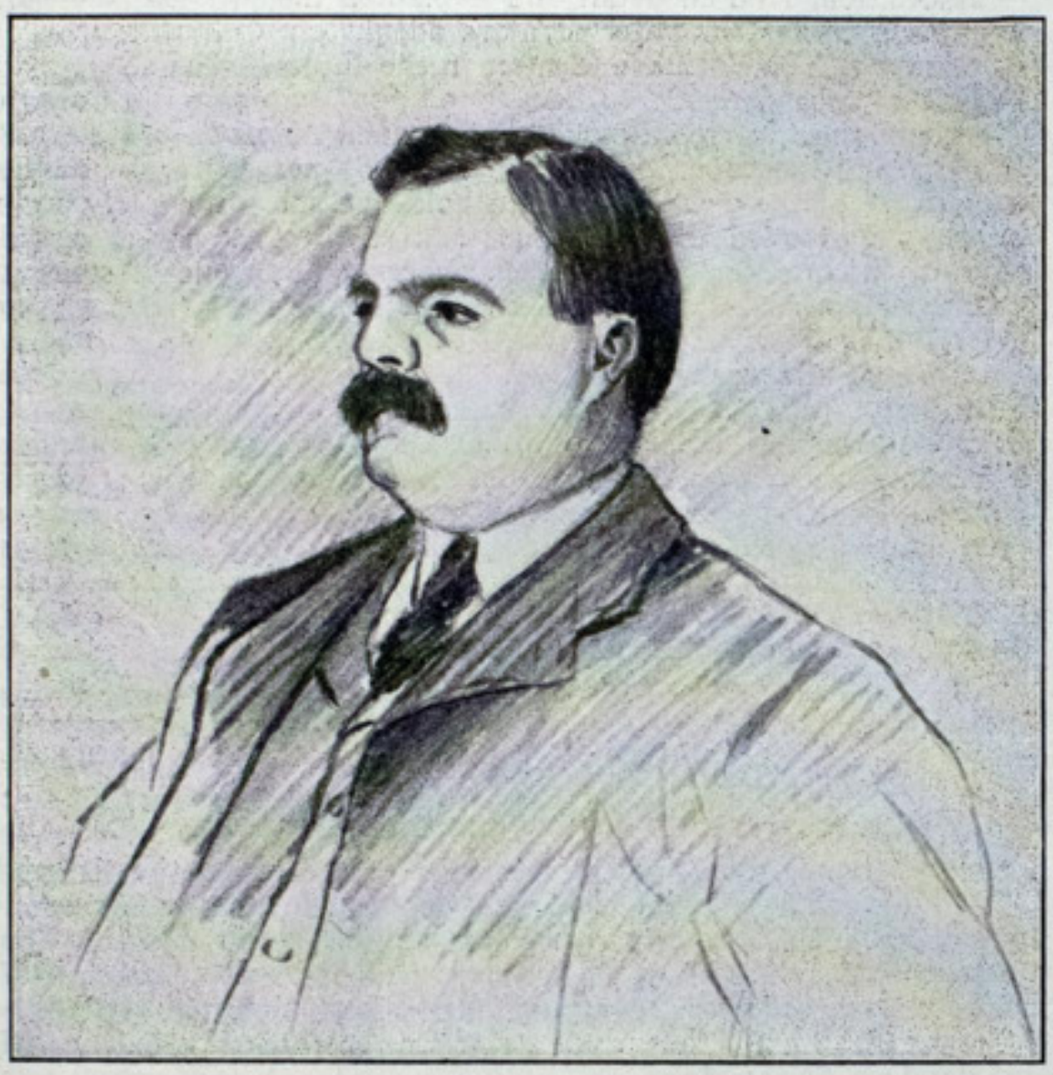
The special committee on reorganization consisting of Frank J. Firth, Wm. Livingstone, H. Coulby, H. D. Goulder and J. C.

Gilchrist, which was appointed on Dec. 13 last to draft the plan of incorporation, was instructed to take the necessary steps to put it into actual operation at once. Capt. M. M. Drake was added to the committee to relieve Mr. Goulder, who will act as counsel. Proxies will be secured by the committee, so that it will not be necessary for any of the subscribers to take part in the numerous details of reorganization. The committee is instructed to act with all possible dispatch.

DISTRIBUTION OF STOCK, OFFICERS, ETC., OF THE NEW BODY.

In summing up briefly the main features of the agreement of incorporation it may be said that the capital stock is $20,000; that this is to be divided into 20,000 shares of $1 each, and as each share is to represent 100 net enrolled tons of vessel property, the capital will admit of membership in the association to the extent of 2,000,000 tons. This is, of course, a provision for future enlargement. The matter of dues for support of the organization will be provided for in the by-laws and regulated by the directors. The management is to be in the hands of twenty-one directors, with direct charge entrusted to an executive committee of five. This executive committee, selected from the principal ports of the lakes, will have wide powers and its members will very probably be paid for giving up a large part of their time to affairs of the association. The officers, to be elected by the board of directors, will be a president, vice-president, secretary and treasurer and counsel.

The name, Lake Carriers' Association, is to be the same, and Detroit is named as the headquarters on account of holding the



Mr. H. Coulby. [*Lead Pencil Sketch.*

annual meetings at that point. The object and purposes for which the corporation is formed are thus stated:

"To establish and maintain shipping offices for the convenient securing of seamen for vessels on the great lakes, their connecting and tributary waters; to establish and maintain and procure the establishment and maintenance of aids to navigation; and improve and secure the improvement of channels, docks, wharves, loading and unloading and terminal facilities; to establish and maintain by contract or otherwise such amicable relations between employers and employed as will avoid the public injury that would result from lock-outs or strikes in the lake carrying service; to provide, so far as may be, for the prompt and amicable adjustment of matters affecting shipping and the interests of vessel owners of the great lakes and their connecting and tributary waters, and to lease, rent, purchase or sell such real or personal property as may be necessary or convenient in carrying out the foregoing purposes."

Clauses telling who the stockholders are to be and dealing with dues are:

"Stock may only be prescribed by owners of enrolled vessels or their representatives, and each subscription must designate as a part thereof the name and net enrolled tonnage of each vessel, and shall be limited in amount to one share for each 100 net enrolled tons of vessel property so owned or represented, with fractional share for odd tonnage, and no subscription shall be received for less than the number of shares necessary to include the net enrolled tonnage of a single vessel."

"Each stockholder shall be subject to annual dues, as and in an amount to be determined by the board of directors under the by-laws of the association, and the right to vote shares of stock at meetings of the stockholders shall be conditioned upon the payment of dues so imposed and full compliance with all the by-laws of the association and all or any regulations made by the board of directors or stockholders touching the same."

As showing the conditions under which the stock is to be issued the following is quoted from the form of stock subscription:

"The undersigned, severally owning or representing the vessel or vessels of the net enrolled tonnage designated, do hereby subscribe to the number of shares of capital stock of the Lake Carriers' Association set opposite our respective names and agree to pay for the same the sum of $1.00 per share when and as called for by the board of directors of said association; and also agree to pay all dues which shall be imposed by the board of directors under the by-laws. And we further severally agree that said association shall have a first lien upon said stock for all such dues, with power of recall and cancellation at book value in case of non-payment of such dues, without prejudice to its right to collect the balance of such dues, and that such stock shall be held subject to all limitation at any time imposed by the by-laws of said association, or by any resolutions by the board of directors or stockholders touching the same, and hereby waive all right to vote the same at any meeting of the stockholders of the association except upon compliance with all provisions of such by-laws and resolutions, including payment of dues."

The second Tuesday of January each year is fixed as the date of annual meeting.

A LIST OF MEMBERS AND OTHERS IN ATTENDANCE.

Among vessel men in Detroit in attendance at the meetings of the Lake Carriers' Association and Lumber Carriers' Association, were the following:

Cleveland—James Corrigan, M. A. Bradley, John Corrigan, Robert Logan, A. P. Macdonald, E. T. Laundon, Chas. O. Jenkins, J. H. Jenks, J. A. Current, J. W. Farley, E. L. Fisher, H. J. Reynolds, H. A. Drury, W. R. Bartlett, H. A. Hawgood, H. Coulby, C. H. Prescott, Jr., Edward Morton, T. F. Newman, John F. Wedow, J. H. Sneadle, Alfred Mitchell, C. H. Woodford, Fred Sall, E. T. Bierce, A. J. Gilchrist, C. T. Williams, F. W. Jackson, A. L. Rumsey, Arthur Hawgood, F. G. Seither, Harvey D. Goulder, Martin Connors, O. W. Upson, Mark Hanlon, John Manuel, C. A. Krauss, Jr., D. C. McIntyre, T. E. Hurley, Geo. V. Callahan, Chas. Hutchinson, H. C. Donaldson, W. E. Chapman, Wm. Gerlach, C. A. Canfield, W. H. Teare, Frank S. Masten, N. J. Boylan, John Kelley, W. A. Hawgood, Capt. F. A. Fick, J. N. Hahn, R. B. Wallace, Geo. P. McKay, W. H. McGean, Henry Steinbrenner, Cyrus Sinclair.

Chicago—R. L. VanArsdale, Jr., C. W. Elphicke, J. J. Rardon, D. Sullivan, E. A. Schuyler, H. A. Foss, Geo. J. LeBeau, J. C. Evans, Scott J. Dow, F. M. Osborne, T. L. Osborne, E. J. Fleming, Thos. J. Prindiville, Edward Hines, Miles E. Barry, J. A. Calbick, H. B. Earhart, J. G. Keith, W. D. Hamilton, J. J. Daley, Thos. Knudson, L. Windmueller, C. W. Farr. R. J. Dunham, Arthur C. Helm, G. E. Lob, and A. W. Nyquist of the McLean Hydraulic Signal Co.; Geo. R. Carr of the Dearborn Drug & Chemical Works.

Detroit—Wm. Livingstone, C. B. Calder, H. W. Baker, Richard Cusen, J. W. Millen, J. W. Westcott, A. A. Parker, Henry Wineman, Jr., Byron Whitaker, C. W. Kotcher, C. A. Chamberlin, W. H. Hargrove, Capt. John C. Ivers, John C. Fitzpatrick, Frank E. Kirby, L. C. Waldo, A. C. Shantz, Capt. A. J. McKay, Stanley B. Smith, John Shaw, A. T. May, Capt. Enos J. Burke, C. W. Nestor, Capt. Hugh McAlpine, Capt. Wm. McAlpine.

Buffalo—L. H. VanAllen, Edward Smith, J. J. H. Brown, August Jean, J. McDougall, Wm. M. Barr, H. B. Root, J. B. Hall, L. P. Goodale, T. T. Morford, T. W. Kennedy, John McGowan, E. T. Evans, G. L. Douglas, G. W. Maytham, Charles Maytham, J. Maytham, T. B. Quinn, K. Pederson, J. W. Johnston, C. S. Mahoney, E. T. Hitchcock, Junius S. Smith, John J. Manion, Thos. Cavanaugh, D. J. Nelligan, John J. Boland, W. J. Conalon, J. D. Green, J. L. Nixon, M. Nagle, Harvey L. Brown, M. M. Drake, John Joyce, J. E. Sheehan.

Milwaukee—W. H. Meyer, John Schlosser, John Mertes, John D. Wanwig, H. J. Pauley, T. W. Sheriffs, F. W. Smith, A. Gibbs, W. J. Carter, Chas. Foster, S. O. Neff, S. Neff, Capt. A. B. Davis, Capt. Henry Leisk.

Port Huron—A. M. Carpenter, Wm. G. Jenks, Frank D Jenks, Charles Duncan, Frank H. Danger, Daniel McMorran, Edward Johnson, John McCarthy, Ezra Davis, H. E. Runnels, Collin McLachlan, James Fleck, George Pierce, Andrew Ganes, Melvin Budd, Henry McMorran, A. C. May, Henry Zeland, Dennis Lynn.

Algonac—Angus Smith, H. Moore, J. A. Smith, S. A. Lyon, C. B. Galton, Fred Galton, R. C. Jackson, B. D. Townsend, J. P. Harrow.

Marine City—G. W. Parker, John Jenkins, E. H. Westbrook, W. H. Scott, Wm. Shorkey, J. A. Ward, H. W. Scott, George A. Shaw, W. Smith, Wm. Burns.

From various places—Frank J. Firth, Philadelphia; Daniel Lynn of the National Lead Co., New York; M. J. Lynn of the Crandall Packing Co., Palmyra, N. Y.; W. M. Mills, North Tonawanda; H. L. Shaw, Wm. E. Pierce, Bay City; H. A. Calvin, Garden Island; O. W. Blodgett, Bay City; W. L. Martin, Cheboygan; L. Hartman, John W. Robinson, Tonawanda; C. E. Rowland, Geo. F. Bell, Toledo; W. E. Rice, Harbor Beach; D. Mc-

Millan, Muskegon; J. P. Nagle, Toledo: Myron W. Mills, H. G. Kendall, Marysville; John Mullen, Amherstburg; F. W. Gilchrist, Alpena; D. T. Helm, Duluth; Columbus Dill of the Ashton Valve Co., Boston; John Craig, L. S. Sullivan, John Reed, A. W. Colton, W. S. Brainard, Toledo; Henry Duff, Amherstburg; W. J. Lynn, Mt. Clemens; Sydney Scott, Mt. Clemens; T. F. Madden, Bay City; A. L. Stewart, Alex Begg, Bay City; J. O. Nesson, Manistee; Alex. R. Sinclair, C. H. Weeks, Duluth; Guy White, Tonawanda; A. W. Comstock, Alpena; W. H. Sharp, John Ritchie, Fred Kirker, Bay City; H. L. Wilton, Detroit; R. C. Brittain Saugatuck; H. H. Lockwood, E. E. Koch, Sandusky; Charles West, Manitowoc; Geo. Robertson, Grand Haven; Geo. Maul, Port Clinton; John C. Gary, Geo. W. Ryan, Saginaw; A. C. Wanwig, Michigan City, Ind.; Chas. Beyschlag, St. Clair; K. Pederson, Tonawanda.

THE LUMBER CARRIERS.

Although the lumber carriers had a poor year in 1902 and there was much dissatisfaction on account of alleged cutting of rates, they decided to bury their differences and will go along with their association during the coming year on practically the same lines. Of course they expect to profit by experience of the past season in the matter of freights. They are hoping that the general committee, by dividing its work up into districts, and by enforcing regulations for which provisions were not made in the past, will be in better control of the freight situation. Nothing was done as to freights at the meeting. That is a matter left with the general committee, and no freight contracts are to be made except in accordance with regulations to be adopted by the committee. It is also expected that this committee will take some action in the matter of delaying the start of vessels in the spring. To this body was also submitted a schedule of wages which the Association of Masters and Pilots suggests for the coming season. Action on the schedule was, of course, deferred, as the members of the association said they could not well talk of wages or other expense matters until they know something of what freights are to be.

The following officers were elected for the ensuing year: F. W. Gilchrist, Alpena, president; Henry McMorran, Port Huron, first vice-president; W. H. Teare, Cleveland, second vice-president; J. O. Nesson, Manistee, third vice-president; H. E. Runnels, Port Huron, secretary and treasurer.

The board of managers for next year will be as follows: F. W. Gilchrist, O. W. Blodgett, Henry McMorran, Edward Hines, C. E. Rowland, J. A. Calbick, Wm. H. Teare, C. H. Prescott, Jr., C. H. Weeks, Alex R. Sinclair, J. J. Boland, E. L. Fisher, John W. Robinson, H. H. Lockwood, L. S. Sullivan, H. E. Runnels, Guy White, W. L. Martin, A. W. Comstock, W. H. Sharp, J. O. Nesson, H. L. Wilton, V. T. Mashek, W. Kotcher, R. C. Brittian, Chas. Foster, C. T. Williams, W. D. Hamilton, G. W. Nestor.

WAGE SCHEDULE FROM MASTERS AND PILOTS.

A notice to the vessel owners while in annual session at Detroit that the Association of Masters and Pilots of Steam Vessels, or rather the lake harbors of the organization, had agreed upon a schedule of wages and asked that the same be given consideration was not altogetner surprising, although it was rather expected that the scnedule would be confined to the mates, who had reason in many cases for complaint on account of the wages they received in the latter part of last season as compared with the second-engineers, watchmen and wheelmen, who were organized, and demanded advances. The schedule is made up, however, to apply to even the masters of the largest type of ships and was formally presented by a committee of the Masters and Pilots' Association to the Lake Carriers during the Detroit meeting. Of course it does not necessarily follow that immediate preparations are to be made to enforce such a schedule during the coming season, but this action shows that a systematic effort is undoubtedly being made to have all masters as well as mates deal with the wage question through organization. This move at Detroit is the first step in that direction. It is well known that within the past few weeks the association of masters and pilots has been taking into its ranks in great numbers the members of the beneficial organization known as the Ship Masters' Association, which includes a very large portion of the men who have the best commands in the lake fleet.

The schedule is a stiff one and is as follows:

Vessels of 3,000 tons and over—Masters, $2,500 a year; first pilots, $135 a month; second-pilots, $115.

Vessels of 2,000 to 3,000 tons—Masters, $2,250 a year; first-pilots, $135 a month; second-pilots, $115.

Vessels of 1,500 to 2,000 tons—Masters, $2,000 a year; first-pilots, $125 a month; second-pilots, $100.

Vessels of 1,000 to 1,500 tons—Masters, $1,800 a year; first-pilots, $110 a month; second-pilots, $95.

Vessels of 400 to 1,000 tons—Masters $1,600 a year; first-pilots, $100 a month; second-pilots, $85.

All vessels under 400 tons to be advanced 20 per cent. over last year.

Of course this schedule as well as all other wage matters must await consideration until a later date and this was very probably expected when it was presented.

Annual Report of the Board of Managers Lake Carriers' Association.

To the Members of the Lake Carriers' Association:—

The board of managers of the association submits herewith its annual report as follows:

MEMBERSHIP AND TONNAGE.

The tonnage enrolled in the association during the past year was 1,014,066 tons, an increase of 139,863 tons over the previous year, and the largest in the history of the association. Strenuous efforts were made, especially by Capt. McKay, to bring the enrolled tonnage up to the million mark, and the efforts were even a little more than successful.

The total tonnage of 1902 was made up as follows: Steel vessels of over 1,400 tons and wooden vessels of over 1,800 tons paying the highest rate of dues, 699.053 tons; steel vessels under 1,400 tons, 74,158 tons; wooden vessels under 1,800 tons, paying the lowest rate of dues, 240,855 tons. The average rate of dues per ton for the season was .0336. Vessels of 47,316 tons were in for half the season only on account of boats that came out late in the season and boats that were lost.

The total number of vessels enrolled in the association was 640, and their tonnage amounted to 1,014,066, as stated. The different ports represented in number of boats and tonnage were as follows:

Port	Number of vessels.	Tonnage.
Cleveland, O.	304	400,548
Bay City, Mich.	9	22,980
Buffalo, N. Y.	53	96,237
Chicago, Ill.	35	42,828
Detroit, Mich.	47	65,695
Duluth, Minn.	117	303,796
Erie, Pa.	5	10,450
Manitowoc. Wis.	1	190
Milwaukee, Wis.	21	23,421
N. Tonawanda, N. Y.	13	11,852
Oswego, N. Y.	2	2,327
Ottawa, Ont.	5	11,150
Port Huron. Mich.	2	3,033
Sault Ste. Marie, Ont.	6	6,161
Sheboygan, Wis.	1	1,225
St. Clair. Mich.	1	1,748
Toledo, O.	18	10,425
	640	1,014,066

FINANCES OF THE ASSOCIATION.

The annual report of the treasurer of the association is submitted herewith showing $34,102.86 collected in dues, as compared with $26,000.00 in 1900, and $32,668.50 in 1901. The United States lighthouse board has paid $5,675.00, amount of installments earned on contracts for private lighting. All bills are paid to Jan. 1, 1903, and the treasurer reports a balance of on hand of $6,311.96.

The board of managers therefore reports that the association closes the year with a good balance of cash on hand, and the finances in every way in satisfactory condition. The report of the treasurer is printed and attached to this report, so that members may examine the transactions of the association in detail.

OPERATIONS OF THE SHIPPING OFFICES.

During the past season shipping offices have been maintained at Cleveland, Chicago, South Chicago. Milwaukee, Buffala, Conneaut, Ashtabula and Toledo, the same as during 1901. The total number of men shipped during the season of 1902 through all the offices was 11,523, as compared with 16,681 in 1899, 14,987 in 1900, and 16,766 in 1901. The number of men shipped through each office during 1902 was as follows:

Cleveland,	2,469	Conneaut.	1.733
Chicago,	1,051	Ashtabula,	1,460
South Chicago.	1,155	Toledo,	972
Milwaukee,	1,040		
Buffalo,	1,644	Total,	11,523

GRAIN SHOVELING AT BUFFALO.

At the last annual meeting a resolution was adopted providing that the system of grain shoveling at Buffalo be continued by the committee in charge under the same superintendent. On the authority of such resolution Mr. T. W. Kennedy continued his employment as superintendent without other contract, and in April he entered into an agreement with the International Longshoremen's Association, substantially on the terms of the agreement of 1902. The detailed report of the superintendent will be printed and ready for distribution at this meeting.

RIVER AND HARBOR BILL.

In the annual report of the board of managers for 1901,

read at the annual meeting of the association last January, attention was called to the failure of the river and harbor bill to pass the last congress; and that the bill which failed provided for an unusual number of important projects on the great lakes. However, the failure of said bill merely delayed the important projects, because a new bill was prepared last winter, which passed both houses of congress, and has become a law. The Honorable Theodore E. Burton was chairman of the house committee which prepared the bill, and he, with the assistance of the other members of the committee from lake districts, had fully impressed the committee and congress with the importance of the lake commerce, to the end that the bill as passed contained suitable appropriations for all of the greater works proposed as well as the works of minor and local interest.

Probably the project of most importance ultimately to the lake interests as well as to the general prosperity of the country was the creation of an International Commission on lake levels, which had been referred to and recommended by your board of managers in their reports of several years past.

Section 4 of the river and harbor bill provides "that the president of the United States is authorized to invite the government of Great Britain to join in the formation of an International Commission, to be composed of three members from the United States, and three who shall represent the interests of the Dominion of Canada, whose duty it shall be to investigate and report upon the conditions and uses of the waters adjacent to the boundary lines between the United States and Canada, including all of the waters of the lakes and rivers whose natural outlet is by the River St. Lawrence to the Atlantic ocean; also upon the maintenance and regulation of suitable levels: and also upon the effect upon the shores of these waters and the structures thereon, and upon the interests of navigation, by reason of the diversion of these waters from or change in their natural flow; and, further, to report upon the necessary measures to regulate such diversion, and to make such recommendations for improvements and regulations as shall best subserve the interests of navigation in said waters. The said commissioners shall report upon the advisability of locating a dam at the outlet of Lake Erie, with a view to determining whether such dam will benefit navigation, and if such structure is deemed advisable, shall make recommendations to their respective governments looking to an agreement or treaty which shall provide for the construction of the same, and they shall make an estimate of the probable cost thereof. The president, in selecting the three members of said commission who shall represent the United States, is authorized to appoint one officer of the corps of engineers of the United States army, one civil engineer well versed in the hydraulics of the great lakes, and one lawyer of experience in questions of international and riparian law, and said commission shall be authorized to employ such persons as it may deem needful in the performance of the duties hereby imposed; and for the purpose of paying the expenses and salaries of said commission the secretary of war is authorized to expend from the amounts heretofore appropriated for the St. Mary's river at the falls, the sum of $20,000, or so much thereof as may be necessary to pay that portion of the expenses of said commission chargeable to the United States.

The commissioners have not yet been appointed, but the proposition will doubtless be carried out.

The river and harbor bill provides for the improvements in Detroit river from Detroit to Lake Erie on the continuing contract plan, and authorizes the secretary of war to enter into contracts for such improvements to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate $1,250,000, exclusive of the amounts theretofore appropriated.

The bill also includes appropriations of $350,000 for improving St. Clair Flats canal, and authorizes the expenditure of $20,000 at Sailors' Encampment, and the balance remaining of certain appropriations for the widening and improvement of the Saint Mary's Falls canal above the locks; and $500,000 for improving Middle and West Neebish channels in the St. Mary's river; and also authorizes the secretary of war to enter into contracts for the further prosecution of the work of improvement of the said Neebish channels, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate $4,000,000.

Mr. Harvey D. Goulder. [*Lead Pencil Sketch.*

The river and harbor bill of 1894 was amended by the bill of 1902 so as to make it the duty of the secretary of war to prescribe such rules and regulations for the use, administration and navigation of any or all canals and similar works of navigation that now are or that hereafter may be owned, operated or maintained by the United States as in his judgment public necessity may require; and he is also authorized to prescribe regulations to govern the speed and movement of vessels and other water craft in any public navigable channel which has been improved under authority of congress, whenever in his judgment such regulations are necessary to protect such improved channels from injury; or to prevent interference with the operations of the United States in improving navigable waters or injury to any plant that may be employed in such operations.

Substantially, all of the works of a general public nature which the Lake Carriers' Association has been advocating, were suitably provided for in the river and harbor bill.

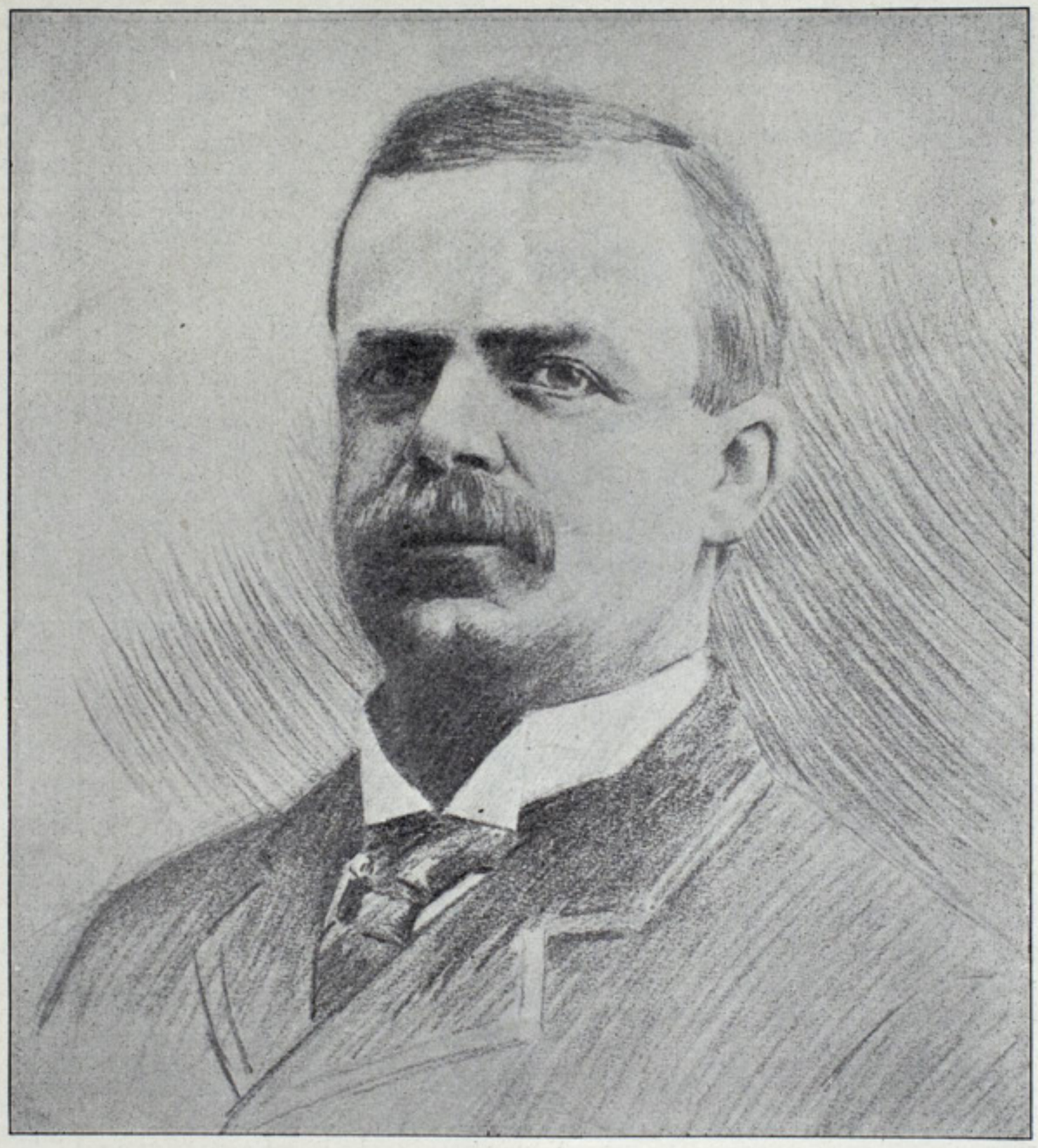
SAULT POWER CANAL.

The river and harbor bill also contains a grant or license to the Michigan Lake Superior Power Co. of Sault Ste. Marie, Mich., to divert water from the St. Mary's river into its power canal for water power purposes, on certain conditions precedent, however, which were satisfactory to the representatives of the Lake Carriers' Association. This matter is of such importance that it seems best to set out in full the provisions of the bill on that subject, which are as follows:

"Subject to the express precedent conditions hereinafter mentioned, the Michigan Lake Superior Power Co. of Sault Ste. Marie, Mich., its successors and assigns, after first obtaining consent of the secretary of war and the chief of engineers and their approval of the said canal and remedial works proposed, is hereby authorized to divert water from the St. Mary's

river into its water power canal now being constructed at Sault Ste. Marie, Mich., for water power purposes while and so long as such works and diversion of water from said river shall not injuriously affect navigation therein, nor impair or diminish the water levels or any natural increase thereof, either in Lake Superior or in the United States ship-canal and locks of the navigable channels, locks, or ship-canals connected therewith, whether natural or artificial, now existing or which may hereafter be established or created by the United States for navigation purposes.

"And conditioned further, that said company shall establish, maintain and operate suitable and sufficient remedial and controlling works in the rapids of said river, to the approval of the secretary of war and the chief of engineers; and said company shall maintain and operate said canal and works in accordance with any rules and regulations that may hereafter be recommended by any International Commission and that shall become operative. Whenever in the judgment of the secretary of war, the operation of said canal and remedial and controlling works, or either of them, either in themselves or in conjunction with any other canal or canals in the United States or Canada which now or hereafter may exist, is injuriously affecting water levels or the navigation of Lake Superior, the River Saint Mary's or other channels, locks or ship-canals connected therewith as hereinbefore provided, he shall impose upon said company such rules and regulations for the operation of said canal and remedial works, as may, in his opinion, be necessary to prevent such injury. It shall become his duty, and he shall have the authority to enter upon the property of said company and to close said canal in whole or in part to the extent necessary to maintain water levels and to require said company, at his own expense, to remove, add to or modify said works or any part thereof to the extent necessary to maintain water levels. Neither the secretary of war nor the chief of engineers or any officer or other person acting under direction of them or either of them, shall be in any way liable by reason of any thing done in the execution of this provision.



Capt. A. B. Wolvin. [*Lead Pencil Sketch.*

"All remedies herein provided, however, shall be cumulative and shall be without prejudice to any other remedies either of the United States or of individuals for failure of said company to maintain said levels for navigation purposes as herein provided.

"Nothing herein contained shall be held to affect any existing riparian or other rights of any person or corporation or the existing remedies therefor, or any action at law or equity now pending. The right is hereby expressly reserved to congress to alter, amend or repeal the provisions contained in this paragraph."

During the session of the former congress an agreement was arrived at in conference between the representatives of the Sault Power Co. and a committee of the Lake Carriers' Association, and a bill was drawn which would protect the interests of navigation, and was also satisfactory to the Power company. As reported at the last meeting, no steps had been taken on the part of the Power company to have such bill enacted into law; although the work of the power company at the Sault was proceeding in the meantime. While the river and harbor bill was still pending in committee the suggestion came that the bill agreed upon as aforesaid might be enacted as a part of the river and harbor bill. Your representatives therefore went to Washington, and there met the consul and representatives of the Sault Power Co. A bill was proposed by the Sault power people which, in Mr. Goulder's judgment, did not adequately protect the transportation interests, and there were several protracted conferences between the different interests for the purpose of considering a compromise measure.

Your president and secretary had been in Washington for some time before the president called for a meeting of the special committee. The members who responded to the call were Messrs. F. J. Firth, A. B. Wolvin, W. C. Farrington, James Corrigan, Howard L. Shaw and Edward Smith. Your committee met at the New Willard hotel in Washington on Mar. 15, 1902, and considered the measure proposed by the counsel for the Sault Power Co., and were advised by Mr. Goulder. Your counsel took the position that he would not advise any measure which did not provide and make it a condition precedent that any rights granted the Sault Power Co. should fail to be of no effect in case the depth of water should be unfavorably affected. In the various conferences with the Sault Power interests such proposition was maintained, and finally after several days of conference the parties appeared before the river and harbor committee, and at last practically agreed upon the measure hereinbefore quoted, which became a part of the river and harbor bill. Therefore, the board of managers are now able to report that the Sault Power matter, which has been pending for several years, and has been of great interest to the Lake Carriers' Association, has been brought to a satisfactory conclusion, and the navigation interests protected to the utmost possible degree.

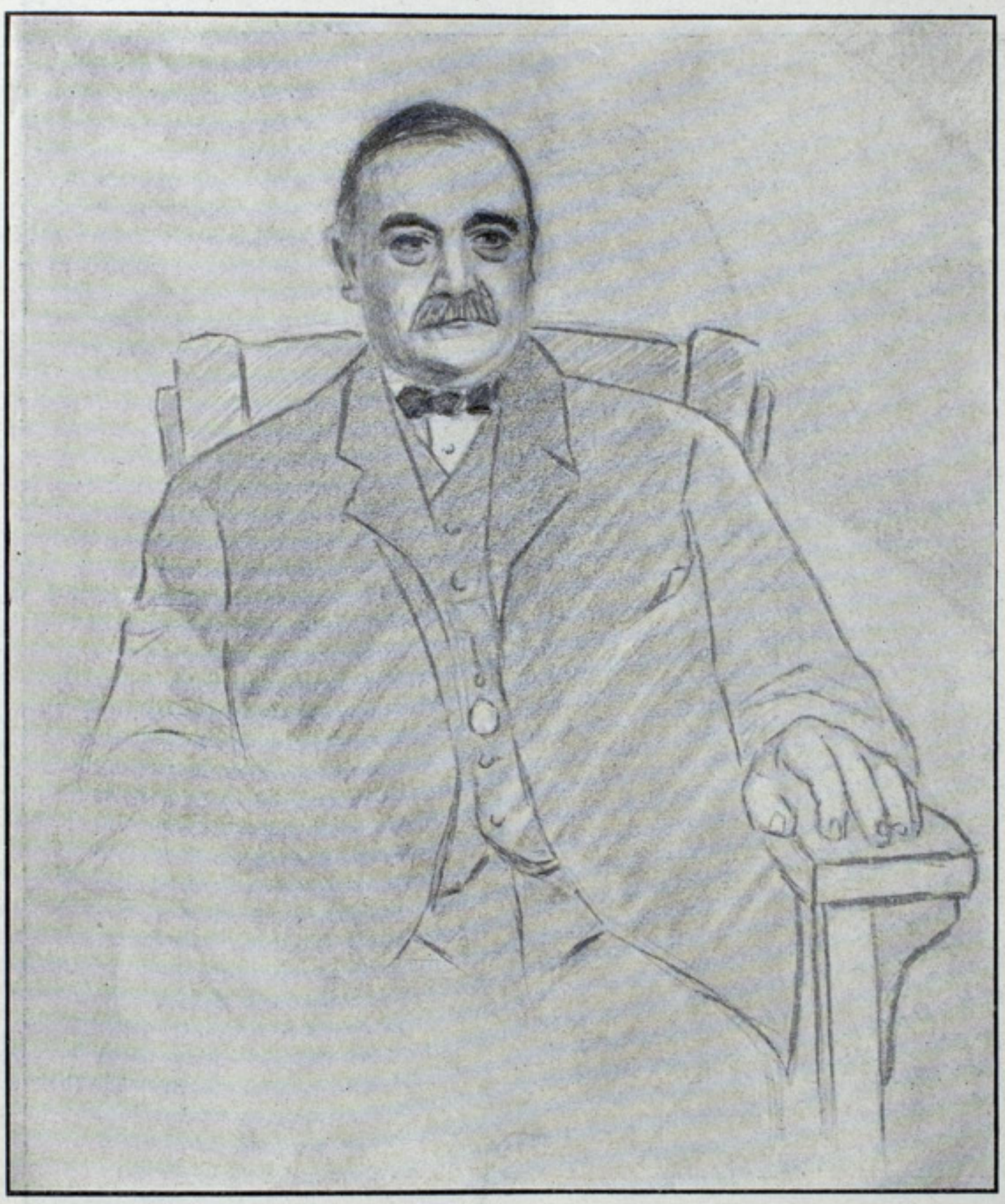
PRIVATE LIGHTING IN 1902.

The system of private lights in the lower Detroit river was maintained during the season by the Lake Carriers' Association as in former years, with the addition of several float lights. Your legislative committee, with the aid of Mr. Burton and Senator McMillan, were able to have inserted in the sundry civil appropriations bill an appropriation of $4,000 to the lighthouse board for the purpose of enabling that board to enter into contract for the maintenance of such lights in lower Detroit river. After the passage of the bill your executive officers proposed to contract with the lighthouse board to maintain such lights for the exact amount of the appropriation, $4,000, and such contract was entered into, for maintenance of the lights from July 1, 1902, to July 1, 1903, the appropriation to be payable in two installments. Reference to the report of the treasurer will show that the installment due Jan. 1, 1903, for $2,000 has been paid. The like contract of the former year was for $3,350, although the actual cost to the association was more than that.

It was suggested in the report of last year that the government ought to relieve the association from the expense of maintaining its lightship on Southeast shoal, as well as from the expense of maintaining lower Detroit river lights, and for the same reasons. Carrying out this suggestion, your officers sought

to have an appropriation of $4,000 included in the estimates of the lighthouse board. to enable the board to contract with your association for the maintenance of the lightship. We failed to have said estimate included, as it was not approved by the lighthouse board, and we therefore applied to Senator McMillan, and he procured the appropriation of the sum of $4,000, to the lighthouse board to enable them to contract for maintenance of such lightship, by way of amendment to the sundry civil bill. The appropriation having been made, your officers made a proposition to the lighthouse board to maintain such lightship for the amount of the appropriation, $4,000, which proposition was accepted, after several months of negotiation. A contract was therefore entered into in October. which was dated July 1, whereby the Lake Carriers' Association agreed to maintain such lightship during the season of navigation from July 1, 1902, to July 1, 1903, for the sum of $4,000, payable in equal installments Jan. 1, 1903, and July 1, 1903. The installment earned has been received, as will appear from the treasurer's report. The association has therefore been relieved from the greater part of the expense which it had theretofore borne for private lighting. The lighthouse board has included in its estimates for this year the item of $4,000 for lower Detroit river lights and $4,000 for lightship at Southeast shoal, so it will be necessary for the Lake Carriers' Association to give attention to the appropriations bill, so that these items may not be left out.

A bill was introduced at the last session of congress by Senator McMillan, and in the house of representatives by Mr. Burton of Cleveland, providing for the construction of a lightship to be stationed at Southeast shoal, and the appropriations bill contained an appropriation of $45,000 for the purpose of carrying out the project. The purpose of such bill and appropriations was of course to relieve the Lake Carriers' Association from the maintenance of a private lightship at that place. We regret to report, however, that the treasury department has not availed itself of the appropriation, and that nothing has been done toward the construction of such vessel, for the reason that arrangements have not yet been made with the British foreign department for the stationing of a public vessel of the United States in Canadian waters.



Mr. J. C. Gilchrist. [*Lead Pencil Sketch.*

Your officers have kept before the lighthouse board the matter of early closing of light stations on the great lakes, but cannot report that any substantial progress has been made. It was attempted to get the lighthouse board to experiment with Pintsch gas during this winter, but nothing has been accomplished.

AIDS TO NAVIGATION.

The committee on aids to navigation, Geo. P. McKay, chairman, begs leave to present the following:

Last winter the committee was instructed by the association to secure range lights at Pt. Edwards and at Point Aux Pins, upper St. Mary's river, three gas buoys at Stag island, St. Clair river, and a lighthouse at Point Abino, Lake Erie, all in Canadian waters. Your committee begs to report that the Canadian government will put up next spring range lights at Point Edwards and Point Aux Pins and has agreed to furnish three gas buoys on the west side of Stag island, providing the United States lighthouse board will care for them. The Canadian government has no facilities for caring for the buoys. Under date of Aug. 28 last your committee petitioned the lighthouse board to that effect, but no reply has, as yet, been vouchsafed. Concerning the lighthouse and fog whistle at Point Abino, Lake Erie, your committee applied to the Dominion government but received no encouragement. Your committee has suggested to the Canadian government the advisability of building and equipping a tender to care for gas buoys in Canadian waters as a great many points in Canadian waters require buoys. The Dominion government has this subject now under consideration.

An appropriation has been secured for a lighthouse and fog whistle at Crisp's Point, Lake Superior, and it is expected that the improvement will be under construction at the opening of navigation.

Your committee, as directed, called the attention of the lighthouse board to the fact that the aids to navigation on Stannard rock, Manitou island, Passage island, Outer island, Devil's island, and Sand island, Lake Superior, are extinguished before the season of navigation is quite over; that is, the keepers of these lights leave while there are still a considerable number of vessels plying the lakes. With the fact that the keepers do leave your committee has no quarrel whatever. It is quite essential that they should leave their posts while the lake is still open for them to do so; but your committee suggested to the lighthouse board the necessity of leaving upon these islands gas lamps charged sufficiently to burn for two or three weeks unattended after the keepers have left. If the lights are needed at all on these islands they are needed most when navigation is attended with its highest perils: but to this necessary and reasonable request the lighthouse board has paid no attention whatever that we are aware of.

A decided improvement has been secured the past year in the marking of wrecks and other obstructions. Hitherto whenever a wreck occurred it was found impossible to mark it promptly, owing to the fact that the war department claimed to be without facilities to locate it or to be without jurisdiction to mark it until it had been abandoned by the owner or underwriter. Meanwhile, of course, the wreck being in the pathway of navigation was a menace to all passing vessels. One of the storms that passed over the lakes last fall left a series of these wrecks in its wake. An appeal was made to the navy department to send out the gunboat Michigan to locate them and other obstructions. The request was acceded to with refreshing promptitude and the Michigan performed serviceable work. It is gratifying to note also that the corps of engineers have been authorized by the war department to secure whatever means are necessary to mark wrecks promptly in the future. As a practical mears of promptly marking wrecks when located, it is suggested that the inspectors of the lighthouse districts carry reserve buoys with them, which may be placed upon the wrecks by the lighthouse tender. To that end, it is recommended that the lighthouse inspector be clothed with the necessary authority to execute this work.

It is a gratifying circumstances that since the lightship Kewaunee has replaced the old floating light at Southeast shoal,

Point au Pelee passage, Lake Erie, no accidents whatever have occurred at that dangerous spot. The lightship Kewaunee went on her station on Mar. 23 and remained on it until Dec. 19, last boats having passed, a period of 272 days.

The association maintained thirteen float lights and four sets of ranges at Amherstburg and the Lime-Kiln crossing, in lower Detroit river, from Mar. 19 to Dec. 20, a period of 277 days.

Concerning the establishment of additional buoys in St. Mary's river, the lighthouse board has replied that the steamer Marigold has now all the work that she can possibly attend to and that additional aids must wait until such time as a new tender can be secured.

Your committee has requested the secretary of the navy to establish magnetic targets at Lime island, St. Mary's river, and one between Bois Blanc island and the mainland, south passage, Straits of Mackinac, so placed that ships may be headed on the different courses and the deviation taken at once.

Some initial correspondence has been had with the engineers regarding the making of harbors of refuge at Copper Harbor and Lac la Belle, Lake Superior, but the matter has not advanced sufficiently for extended notice. The idea of refuge at these points is heartily endorsed by those who have to navigate this lake and the furtherance of the undertaking is earnestly recommended to the association.

Your committee has the honor to report that the following aids to navigation were secured during the season of 1902:

Gas buoy, Waverly shoal, Lake Erie.

Gas buoy, Seneca shoal, Lake Erie.

Gas buoy, St. Clair Flats canal, lower entrance, east side, Lake St. Clair.

Two float lights, St. Clair middle ground.

Gas buoy, Mackinac island spit.

Gas buoy and bell buoy, on South Graham shoal.

Gas buoy, Rain's island shoal.

Gas buoy, Dark Hole.

Gas buoy, turning point at head of Dyke.

Gas buoy, Cedar point.

Gas buoy, Middle Ground.

Gas buoy, Point Iroquois shoal.

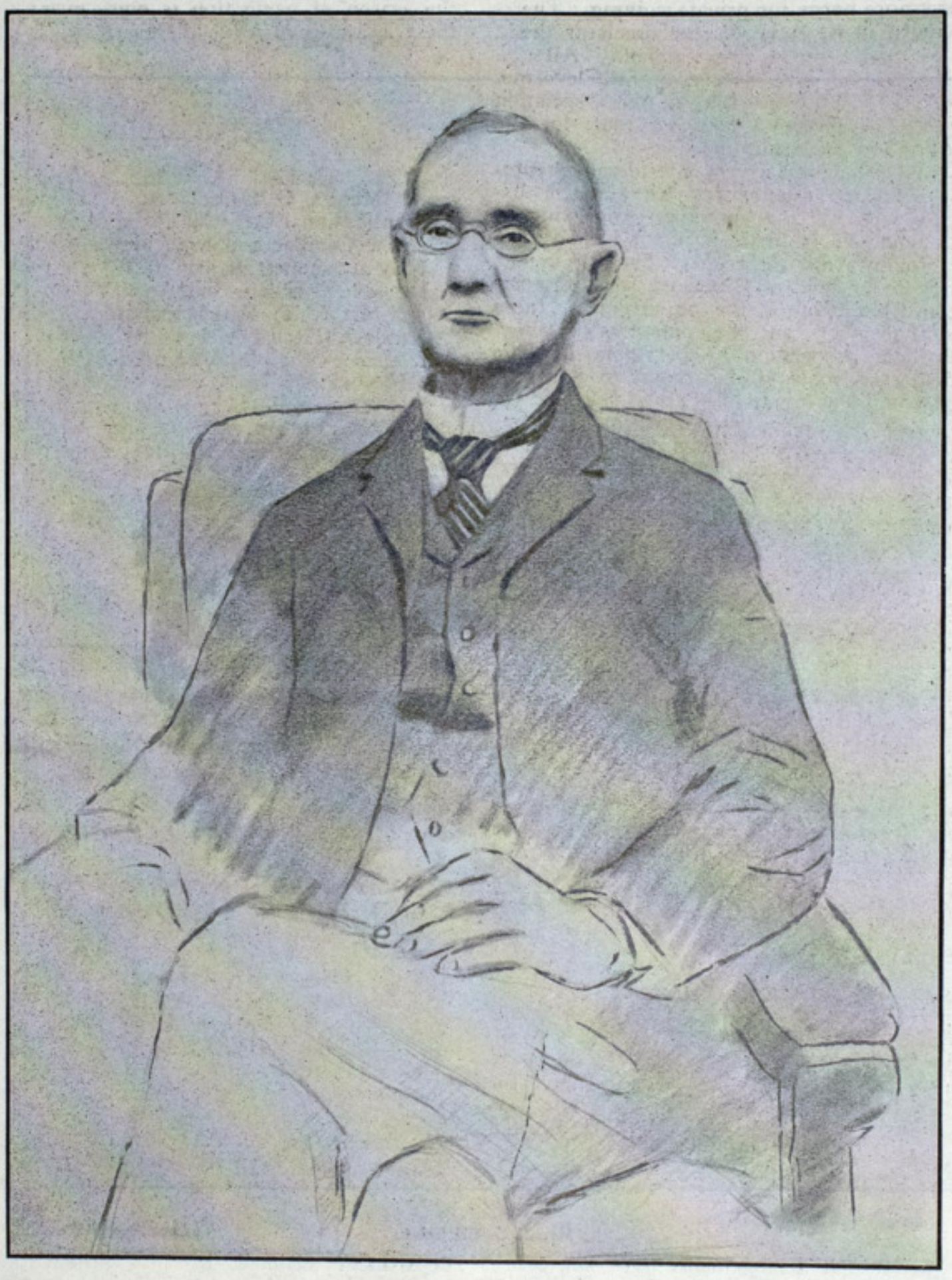
Gas buoy, South Fox island.

Lighthouse and fog whistle, Crisp's point.

The association also maintained and displayed stage of water signals on Smith's coal dock, Detroit, and Pittsburg Coal Co.'s dock, Sandwich, giving all fluctuations of the water at Ballard's reef and Lime-Kiln crossing during the season, which gave to masters of all boats information to govern their actions in running the river.

Thanks are extended to Mr. Stanley B. Smith and Mr. John Mullen for care of said signals during the season just passed.

Thanks are due to the secretary of the navy for the promptitude with which he ordered out the Michigan and to Capt. William Winder for the energy manifested in locating and marking the wrecks; the minister of marine and fisheries of the Dominion government for various favors; to Col. W P. Anderson, chief engineer of the department of marine and fisheries, and Capt. Dunn of the Dominion cruiser Petrel for unfailing courtesies.



Capt. Geo. P. McKay. [*Lead Pencil Sketch.*

PAST ACCOMPLISHMENTS AND FUTURE USEFULNESS.

The Lake Carriers' Association has accomplished much for the benefit of the lake transportation interests, in procuring and maintaining the establishment of aids to navigation and the removal of obstructions, and its work has been very effective in the movement for deep waterways and harbor improvements. In these public affairs the association has not sought simply selfish ends, but has worked for and has accomplished much for the benefit of the country at large. The deepening of waterways, improvements in harbors and establishing aids to navigation, which tend to greater safety of life and property, have all had their share in lessening the cost of transportation by making the vessels in use from time to time more effective in their carrying capacity and ability as well as enabling the vessel owners to build an operate ships of increased size from year to year. This has been of benefit not only to the commercial interests directly involved, but to every citizen of the land. It has had its full share in the development of the iron and steel industry by providing a cheap method of transportation, without which the increase and development of the iron and steel industry could not have been accomplished. It has worked to the benefit of the farmers of the west and northwest, because it has reduced the transportation charges which are paid out of the price of the grain, so that the farmers of this country have been able to procure their products to be transported to the seaboard at a low price, which left them margin and opportunity to sell their products in the world's markets to advantage in competition with the whole world. It has also tended to make the labor of the farmer more effective by reducing the transportation cost of the goods which he consumes, shipped from the east. Stating the fact in general terms, we say that the waterway improvement has been of advantage to all, because it has provided transportation at low cost, so that the exchange both ways from producer to consumer has been at a minimum expense, and both parties to the exchange have had the utmost benefit of their products. One reason, therefore, why the work of the Lake Carriers' Association has been so effective in promoting improvements of a general public nature is that the association has never been used for personal and selfish ends; but when it has sought appropriations or asked for other government aid or favor, it has always been for the benefit of the public interests. This policy of the association has been carried out for so long a time that it is recognized by the authorities at Washington, and has given the association a position and standing which make it a very effective agent in all matters pertaining to the improvement of commerce and navigation upon the great lakes.

It is now proposed to reorganize the association by changing it from a voluntary association of vessel owners to a body corporate, to carry out the same general purposes for which it was originally organized, as well as certain other policies and undertakings, which changed conditions seemed to require that the association take in charge. The handling of grain by contract at the port of Buffalo and the maintenance of shipping offices and the employment of seamen, and the maintenance of lights in Canadian waters by contract with the federal government are matters which have developed from time to time and necessarily became a part of the work of the association. Other matters will arise from time to time, and some have arisen, which make it expedient for the association to enter into contracts concerning things which relate directly to the lake commerce as business propositions, in addition to the affairs of a general public nature. As the association has found it necessary to enter into these enterprises of a more or less private nature, it has seemed expedient to incorporate for all purposes, both of general and of a business nature. The matter has been under discussion for a considerable time, and at the last meeting the president, counsel and secretary of the association were appointed a committee on permanent organization. After a conference with the counsel of the association at Cleveland, your president sent out a call to all members of the association for a general meeting at Cleveland on Dec. 13, 1902, for the purpose of considering plans of reorganization.

The meeting was duly held, with a very considerable representation of the membership in attendance. After much discussion, the subject was referred to a committee consisting of Messrs. Harvey D. Goulder, F. J. Firth, William Livingstone, J. C. Gilchrist and H. Coulby, with the request that they report to an adjourned meeting to be held at Cleveland Dec. 20, 1902. On the last named day, pursuant to the adjournment, there was a large attendance of members, and the committee presented a report proposing that the association be incorporated. The secretary was directed to send copies of the report to all members of the association and other owners of American tonnage on the great lakes, and the matter was referred to the committee again with directions to work out the plan in detail and present the same to the annual meeting. Therefore, in addition to the usual subjects for attention at the annual meeting a plan for the incorporation of the association will be presented by the committee.

DEATH OF MEMBERS DURING THE PAST YEAR.

William H. Mack was in attendance at the last annual meeting of the association. Two months afterwards startling information came that he had met death at the wreck of the schooner Wadena on the Massachusetts coast. A meeting was held in Cleveland and resolutions, reported by a committee composed of John Mitchell, W. D. Becker and James Corrigan, were presented to the meeting and adopted, giving expression to the sense of loss of the members of the association and their sympathy with the mother and sister.

At a meeting of the executive committee, held in Cleveland May 15, 1902, action was taken and resolutions adopted expressing the sorrow of the members of the association on account of the death of Patrick Smith, one of the prominent figures in the affairs of the great lakes, and upon the death of Capt. J. T. Hutchinson, a member of the association since its organization. Appropriate resolutions were adopted and spread upon the minutes of the association.

A special meeting was held at Cleveland on Aug. 12 to take action on the death of Senator James McMillan. Resolutions were submitted by a committee consisting of James Corrigan, H. Coulby, T. F. Newman, Harvey D. Goulder and George P. McKay. The resolutions were adopted and spread upon the records of the association. At the same time a meeting was held in the city of Detroit, at which resolutions were adopted as follows:

"He did not fall
Like drooping flowers that no man noticeth.
But like a great branch of some stately tree,
Rent in a tempest and flung down to death."

"The unlooked for death of Hon. James McMillan gives great emphasis to the poet's lines. Full of life and animation, pursuing the daily tenor of his way, he was stricken down.

"God moves in a mysterious way. The golden chord is loosed, the pitcher is broken at the fountain, and man goes to his long home. We bow submissively, mutely, protesting albeit, and yet the mystery remains unsolvable. The rain falls on the just and the unjust: the good and the bad are taken without discrimination.

"Wealth and power were his because he made honorable conquest of both. Far-seeing and provident, he reaped what he sowed, but never to the injury of his fellowmen. As merchant, manufacturer, ship owner, banker, he accumulated large wealth but in so doing he gave the greatest encouragement to that truest of philanthropy which helps those who help themselves. He was good to the poor, gave alms unsparingly to the needy and distressed, and made the world better for having lived in it.

"The record of a generous life runs like a fragrant vine around his memory. The city, state and nation suffer great loss by his death. In the business world and in the legislative hall he has for years been pre-eminent. He made Michigan strong in the councils of the nation and it is no disparagement to others to say that no man has done so much for the advancement and prosperity of our beautiful city as James McMillan. His imprints are everywhere. It has been well said of him: 'The wheels of industry sing his praises. The white wings of commerce salute him.'

"His untimely death robs this association of one of its strongest and most loyal members. Multiplied words will not enrich the universal respect and affection he commanded in life. Formal phrases of condolence cannot assuage the sorrow that is deep felt by his family and friends. To his bereaved family we extend our heartfelt sympathies.

"He lives in deeds not years, in thoughts not breaths,
In feelings not in figures on the dial;
We count time by heart throbs, he most lives
Who thinks most—feels noblest—acts the best;
Life's but a means unto an end,
The dead have all the glory of the world."

All of which is respectfully submitted on behalf of the board of managers by

WILLIAM LIVINGSTONE, President,
HARVEY L. BROWN, Secretary,
GEORGE P. MCKAY, Treasurer.

CONVENTION NOTES.

Messrs. G. E. Lob and A. W. Niquist of the McLean Hydraulic Signal Co., Chicago, had one of their signals on exhibition at the Cadillac and were kept busy operating it. Almost everybody at the meeting saw it. They had no thought of making sales, but several orders came to them unsolicited.

Mr. F. T. Parks, manager for the Carley Life Float Co., Produce Exchange building, New York, made a great many friends by the pleasant and entertaining manner in which he exhibited models of the Carley float. This device has been described and illustrated in these columns. Mr. Frank E. Kirby and others in attendance at the convention who have had much to do with life saving apparatus were very earnest in their praises of this float.

Mr. George R. Carr of the Dearborn Drug & Chemical Works, Chicago, perpetrated quite a joke on the newspaper men at the Detroit meeting of the Lake Carriers. When they reached their table they found a beautiful yellow pencil lying upon it with this note on the back of one of Mr. Carr's cards: "Hope you may keep the minutes of the meeting with the yellow pencil." They all tried to do so and had a hearty laugh when they successively discovered that the point was of rubber, and very pliable rubber at that. Every victim enjoyed the joke thoroughly when the other fellow tried it. Mr. Carr has made a very large acquaintance among the vessel men. Unfortunately, he was called away from Detroit before the convention was over with, on account of a death in his family.

OFFICERS AMONG MASTERS AND PILOTS.

Duluth harbor, No. 44—Captain, W. J. Green; first pilot, A. C. Majo; second pilot, Henry Fox; captain's clerk and purser, C. D. Hibbard; chaplain, H. E. Ditzel; starboard quartermasters, Andrew Carroll, Fred Winter; port quartermasters, Edward F. England, Chas B. Carroll; saloon watchman, Frank R. Hill; for'd deck watchman, Wm. A. Cooley; trustees, Wm. J. Green, A. C. Majo, H. E. Ditzel; delegate to grand harbor, B. F. Howard; alternate, W. J. Green.

Toledo harbor, No. 43—Captain, A. A. Stevenson; first pilot, Frank Wigton; second pilot, J. B. Warner; chaplain, Frank Nixon; captain's clerk and purser, L. S. Goss; delegate to grand harbor, E. Doville; alternate, Thos. Meiklehem.

Manistee harbor No. 58—Captain P. McGrugan; first pilot, John Ebal; second pilot, M. F. Martin; captain's clerk, John Messner; purser Harris Sanders; delegate to grand harbor, E. W. Skeels.

Ashtabula harbor—W. H. Foster, captain; W. E. Mallov, first pilot; Dan McRae, second pilot; S. A. Cline, chaplain; L. Haggerty, purser; C. J. Starkey, clerk; J. W. Rabshaw, C. W. Lockwood and Edward Wylie, quartermasters; Frank S. Bennett, watchman; ——— Roderick, forward deck watchman; J. J. Parks, J. W. Calloway and George McGary, trustees; C. J. Starkey delegate to grand harbor meeting; Frank Nettleton, alternate.

Chicago harbor No. 33—Captain, C. H. Hubbard; first-pilot, J. E. Kohnert; second pilot, Leroy A. Rand; captain's clerk, W. D. Hamilton; purser, Wm. W. Shaw; delegates to grand harbor, D. A. Curran and J. E. Kohnert.

The American Association of Masters and Pilots of Steam Vessels (national organization) is in annual session in Washington and will continue in session into next week. Our Washington correspondent wired that the convention had just organized when the Review was going to press.

A sub-committee of the house naval committee has recommended a naval program consisting of three new battleships, one armored cruiser, two steel training ships and one wooden brig for training purposes.

NATIONAL OFFICERS OF ENGINEERS.

Washington, D. C., Jan. 22.—The twenty-eighth annual convention of the National Marine Engineers' Beneficial Association was begun at the Colonial hotel in this city on Monday. There are present about eighty delegates representing 18,000 members. Reports of the officers indicate an increase of 30 per cent. in membership during the past year and the organization, financially and otherwise, is in a very satisfactory condition.

At the annual election the following officers were chosen: National president, George Uhler, Philadelphia; first vice-president, Frank A. Jones, San Francisco; second vice-president, Evans I. Jenkins, Cleveland; national secretary, George A. Grubb, Chicago; national treasurer, Albert L. Jones, Detroit; advisory board, W. F. Yates of New York, Joseph Brooks of Philadelphia and William Sheffer of Baltimore. Officers appointed by the president were: Doorkeeper, Charles H. Deidrick, New York; conductor, Perry A. Wilson, Pittsburg; chaplain, E. W. Bray, Norfolk; assistant secretary, Otto Boettger, Baltimore, and George P. Wilson, past national president.

The action taken by the association at the last two annual meetings in favor of government encouragement for the upbuilding of the merchant marine will be reaffirmed. While they endorse the principle, the engineers do not specify any particular form of subsidy. Other matters of importance to be passed upon at the meeting are in an unsettled state and decisive action will not be taken until near the close of the session of the convention in the latter part of the week, or possibly Monday or Tuesday next. It has been decided that the next annual convention shall be held in this city.

SHIP BUILDING IN THE NEWPORT NEWS DISTRICT.

Newport News, Va., Jan. 20. As announced in the last issue of the Review, a general mortgage from the Newport News Ship Building & Dry Dock Co. to the Union Trust Co. of New York has been filed in the office of the clerk of courts, involving $5,000,000 and requiring a tax of $5,010. The mortgage was filed to secure payment on the 5,000 bonds, each of $1,000 face value, which were authorized at the stockholders' meeting of the ship building company held here several days ago. The bonds were issued to pay off certain existing indebtedness. The deed is signed by C. B. Orcutt and Charles Babbidge, president and secretary of the ship building company, and Edward King and J. B. V. Thayer, president and secretary of the trust company. The bonds will mature in fifty years and bear interest at 5 per cent. They were issued not to make improvements and not because the company is in need of money, but, it is understood, to place the relations between the company and the Huntington estate on a better financial basis. The entire property of the yard is granted as security during the life of the bonds.

Capt. Knauss of Columbus, O., vice-president of the Norfolk and Hampton Roads Ship Building & Dry Dock Co. has been at Sewell's Point for several days looking over the site of the proposed ship yard. C. N. Harrison of Ohio, is president and J. Frank Gamble, also of Ohio, is secretary. The land is now being cleared away for the plant and it is claimed that in a few days the engineer and the architect will get together and locate the buildings that will have to be erected first.

J. G. Hunter, surveyor for Lloyd's Register for the Newport News district, embracing this city, Richmond and Baltimore, has completed his annual report, which shows that there was 107,900 tons of ship construction on the ways at the yards inside of the Virginia Capes Jan. 1, not including the new battleship Louisiana, the keel for which has not been laid. During the year the tonnage launched at the three cities aggregated 15,503, being unusually small, owing to the fact that only one vessel was put overboard here, the Old Dominion liner Monroe. The Trigg yard at Richmond launched the Old Dominion steamer Berkley, the revenue cutter Mohawk and the railroad tug Lancaster. The Marvland Steel Co. at Sparrow's Point launched the steamship Tremont. The Baltimore Dry Dock Co. rebuilt and launched the steamship Hero. The present condition of the ships building in the district now follows:

Newport News—Battleship Missouri launched and fitting out; cruiser West Virginia, framed, plating; cruiser Maryland, framed, plating; battleship Virginia, framed, plating; cruiser Charleston, framing, plating; battleship Louisiana, keel nearly ready to be laid; steamship Monroe, launched, fitting out; lumber steamer F. H. Leggitt, framed, plating; Saginaw oil steamship, preparing, frames bent.

Maryland Steel Co.—Steamship Missouri, framed, plating; steamship Maine, framed, plating; steel paddle steamer, keel laid.

Wm. R. Trigg Co.—Cruiser Galveston, ready for launching; revenue cutter Mohawk, launched, fitting out; steel suction dredge, framing, plating; Standard oil steamship, framing, plating; railroad tug Bristol, framing, plating; railroad tug Chester, framing, plating.

The Newport News Ship Building & Dry Dock Co. is considering the advisability of making its own steel castings. As yet no definite move has been made in the matter. If the new works is erected it will probably not be large.

Parties from Lebanon, Pa., who were here recently, talk of establishing a works for the manufacture of ship plates, shapes and other steel mill products. They are in no way connected with the ship yard. They think they see in the shipyard here, the yard at Richmond, the yard at Sparrow's Point, Md., the navy yard at Portsmouth and the proposed new ship yard at Sewell's Point the basis of a market for their output.

The shipyard has made an arrangement with the Old Dominion Steamship Co. whereby all the vessels of the company will hereafter lay up here and be overhauled by the yard instead of laying up at New York for overhauling. One ship will lay up here every week.

Exports from this port for the year 1902 were valued at $29,789,876 and the imports at $10,185,374.10. Collections were nearly $2,000,000, the Newport News custom house being the government's largest single source of revenue in Virginia. The cost to collect a dollar at this port for the government is only .043, this being one of the smallest rates in the country.

The cruiser Albany arrived in Hampton Roads Sunday from Boston and will be overhauled at the navy yard.

REDUCED WAGES IN SHIP YARDS.

Surplus of tonnage is main cause of reduction announced for Clyde workmen —Water-tube question in French Navy—United States ranks third in expenditures for new ships.

Glasgow, Jan. 12—There is no indication for the present as to how the workmen in the ship yards are going to deal with the announcement made by the Clyde Ship Builders' Association that all ship yard wages, both of "black" and "white" squads, will be reduced 5 per cent. on the piece rates and one shilling per week on time rates, at the beginning of February. Most people have been expecting some such announcement for some time past, but that does not make it any more agreeable to the men. That, however, a reduction in the cost of labor is essential to a revival in ship building activity is evident to everybody. The present state of matters in the shipping industry was accelerated by the enormous increase of tonnage which arose from the artificial demand for new boats for the war in South Africa—a war such as from a shipping point of view alone, had never previously been experienced. The war had the effect of prolonging the period of good freights for nearly a couple of years more than in the natural cycle of trade would probably have happened. The freight market accordingly now finds itself burdened with a supply of tonnage altogether beyond normal circumstances. It is this which causes ship owners to think that the present depression is unlikely to be of short duration. Among the factors which have contributed to the bad results in the shipping trade during the past year have been the poor harvests realized in India, the restriction of cattle shipments from the River Plate to this country, and the prevalence of strikes in various parts of the world, but the outstanding cause of the depression has been and still is the excess of tonnage. The crop prospects in India are brighter, and an early removal of the restrictions with regard to the shipment of cattle from Argentina is expected. Another feature which is temporarily mitigating the situation is the demand which exists for coal from all the leading export centers of the United Kingdom for America. This has allowed quite a fleet of steamers to be loaded in this country which in the ordinary course of affairs would have gone out in ballast. The feeling exists that this demand is likely to be continued for at least several weeks to come, or until the worst of the American winter is past. While, therefore, only poor results are generally expected to be realized in the shipping trade during the forthcoming twelve months, it is hoped that opportunities may occur during the new year for occasional profits being realized. The real hope for an improvement in the freight market, however, is in a continued restriction of the building of new tonnage.

A French committee has been investigating the question of water-tube boilers for large ships of the French navy, and whether large or small tube boilers should be used. That has been settled by the engineering experts of the British navy, who decided that small-tube boilers should not be fitted, as the rate of wear was considerably greater than in large-tube boilers, and were suitable only where weight was limited and high speed a first consideration. The French committee has now decided that no small-tube boilers should be fitted to cruisers or battleships, and that in future designs the allowance of grate area should be such that, at full power, the coal consumption should not be greater than 22½ lbs. per square foot per hour, but that there should be a trial of considerable duration with three-fourths of the boilers burning 30 lbs. of coal per square foot per hour. The design is that when one-fourth of the boilers are put out of action the others can be pressed to supply the volume of steam necessary to give full power. At the same time it was suggested that the trials should be of longer duration, as they are at present much shorter than in the British navy. Of the four cruisers of the Drake class the Good Hope consumed most coal per square foot of grate (26.2 lbs per hour), while at three-fourths power the rate was 17.3 lbs. per hour. The Bedford of the County class burned about 30 lbs. per square foot of grate per hour on the full-power run, and at three-fourths power nearly 20 lbs. The Belleville and Niclausse boilers have been ordered for the new French ships,

and the minister of marine has given instructions that the other suggestions should be acted on.

A return has been made at the French ministry of marine to show the naval expenditure of Great Britain, Germany, France, Russia, Italy, Austria, United States and Japan. In ten years the combined navy vote of these nations has almost exactly doubled, having been in 1891-2 just over £47,000,000, while now it is over £92,000,000. This increase has been greater during the second half of the decennial period, the total in 1896 having been over £64,000,000. The first five years had an increase of £17,000,000, and the second period one of £28,000,000. Germany and the United States contributed most of the increase, these two having more than doubled their vote in the past five years, while Russia has increased it by about 70 per cent. and Great Britain by about 40 per cent. Ten years ago the British expenditure was £17,225,000; it increased in five years to about £23,000,000; and in the next five years now ending is to reach £32,000,000. In the case of the United States, which now takes second place as compared with third place ten years ago, the expenditure has gone up in the decennial period by nearly £10,000,000, as compared with the British £14,725,000. In 1891-2 the American vote was £5,840,000, in 1896 nearly £7,000,000 and in 1901-2 nearly £15,725,000. Germany in the the ten years has added nearly £5,000,000 to her naval expenditure, her total ten years and five years ago having been over £4,000,000—the fluctuations were slight—while now it is over £10,000,000. Russia still keeps her place excelling Germany's vote by quite £400,000. Ten years ago the Czar spent on his navy about £5,225,000, five years ago £6,225,000, and last year about £10,500,000. The percentage of increase is thus the same as for all the powers combined. France, although she has not increased her vote at the same rate as the other nations, still takes third place, having been superseded by the United States. Ten years ago the naval vote was £8,380,000, five years ago £10,700,000, and now it is £13,000,000.

UNITED STATES SHIP BUILDING CO.'S REPORT.

The governors of the New York stock exchange last week passed favorably upon the recommendation of the committee on stock list to admit to trading the securities of the United States Ship Building Co. The securities admitted follow: $20,000,000 6 per cent. non-cumulative, preferred stock; $25,000,000 common stock; $14,500,000 first-mortgage 5 per cent. thirty-year bonds, and $10,000,000 twenty-five-year 5 per cent. collateral and mortgage bonds of 1922. The United States Ship Building Co. has contracts for work as of July 1, 1902, at contract prices aggregating $34,377,408.70, of which there remains uncompleted $20,605,639.74. Of this there is estimated for completion during 1902, $6,772,350.15; during 1903, $5,511,757.52; and during 1904, $7,321,532.07. The Bethlehem Steel Co. has on hand as of Aug. 1, 1902, work under contract at contract prices aggregating $16,578,501.81, of which there remains uncompleted work in the aggregate of $11,728,622.67. Following is the general statement:

ASSETS.

Cash at works	$ 389,317.57	
Head office	1,503,000.00	
		$ 1,892,317.57
Accounts and notes receivable		1,215,294.76
Contract work in construction, less payments received on same		2,385,302.51
Merchandise and supplies		1,468,651.21
Miscellaneous assets		155,220.07
United States Ship Building Co. bonds in treasury, at par		1,500,000.00
Total current assets		$ 8,616,786.12
Plant investment (including 300,000 shares of Bethlehem Steel Co. stock)		64,768,201.52
Total assets		$73,384,987.64

LIABILITIES.

Accounts payable		$ 806,453.42
Notes payable		1,528,534.22
Total current liabilities		$ 2,334,987.64
Contingent liabilities		50,000.00
First mortgage bonds, series A	$16,000,000	
Collateral and mortgage bonds	10,000,000	
Preferred stock	20,000,000	
Common stock	25,000,000	
		$71,000,000.00
Total liabilities		$73,384,987.64

STATEMENT OF NET EARNINGS FROM JUNE 30, 1901, TO JUNE 30, 1902.

Statement of the various companies acquired by the United States Ship Building Co.:

Bath Iron Works, as per books	$ 215,194.62
Hyde Windlass Co., as per books	170,740.70
Crescent Ship Yard, as per books	247,974.33
S. L. Moore Sons & Co., as per books	30,291.32
*Harlan & Hollingsworth Co., three years' net earnings, as per books, $282,407.51; average for the above period of the year	94,135.84
Union Iron Works, as per books	$559,959.38
To which we add an estimated loss on account of a strike covering this entire period	450,000.00
	$1,109,959.38
Eastern Ship Building Co., as per books	74,225.84
Total	$1,942,522.03

*The earning capacity of the Harlan & Hollingsworth Co. plant should not be based on these figures, as the three years' net earnings have been diminished by an estimated loss of $180,000 on a steamship contract, not United States government.

BETHLEHEM STEEL CO.

Statement of net earnings for twelve months ending July 31, 1902:

	Sales.	Net earnings.
August, 1901	$ 600,829.64	$ 92,921.89
September, 1901	699,084.12	91,092.92
October, 1901	1,119,315.58	160,521.43
November, 1901	1,012,287.13	69,127.61
December, 1901	852,586.15	115,422.30
January, 1902	903,983.03	101,735.04
February, 1902	375,550.01	8,101.53
March, 1902	765,333.82	125,585.34
April, 1902	843,858.89	120,938.37
May, 1902	632,070.65	93,908.64
June, 1902	850,201.25	134,336.40
July, 1902	927,906.85	327,516.20
Total	$9,592,227.12	$1,441,208.03

GENERAL STATEMENT, JULY 31, 1902.

Cash	$ 206,110.56
Accounts and notes receivable	1,412,872.96
Contract work in construction, less payments	2,086,739.02
Merchandise and supplies	1,446,093.19
Total assets	$5,151,815.73
Accounts payable	$ 800,707.27
Notes payable	350,000.00
Surplus, current assets	4,001,018.46
Total	$5,151,815.73

UNITED STATES SHIP BUILDING CO. AND BETHLEHEM STEEL CO.

Consolidated statement of current assets and liabilities, Aug. 1, 1902:

	United States Ship Building Co.	Bethlehem Steel Co.
Cash	$1,802,317.57	$ 206,110.56
Accounts and notes receivable	1,215,294.76	1,412,872.96
Contract work in construction, less payments received thereon	2,385,302.51	2,086,739.02
Merchandise and supplies	1,468,651.21	1,446,093.19
Miscellaneous securities	155,220.07	
First mortgage 5 per cent. sinking fund gold bonds of the United States Ship Building Co. in treasury at par	1,500,000.00	
Total current assets	$8,616,785.12	$5,151,815.73
Liabilities:		
Accounts payable	$ 806,453.42	$ 800,707.27
Notes payable	1,528,534.22	350,000.00
Contingent liability	50,000.00	
Total current liabilities	$2,384,987.64	$1,150,797.27
Net surplus of current assets over liabilities	$6,231,798.48	$4,001,018.46

EARNINGS FOR THREE MONTHS.

Consolidated statement of the net earnings of the United States Ship Building Co. and Bethlehem Steel Co. for three months ending Nov. 30, 1902:

Earnings		$1,163,022.22
Deduct:		
Reduction on estimated profits on contract work in ship building construction	$ 74,138.04	
Accrued interest and sinking fund payment on all United States Ship Building Co.'s bonds for quarter	391,666.67	
		$ 465,804.71
		$ 697,217.51
Of the earnings of $1,163,022.22, the United States Ship Building Co earned		$ 554,021.45
Bethlehem Steel Co. earned		609,000.77
		$1,163,022.22

AROUND THE GREAT LAKES.

Powell & Mitchell, Marquette, Mich., are the lowest bidders for pier extensions at Grand Marias, Mich. Their bid was $52,721.79.

N. & A. Dument of Barrie, Ont., have purchased the steamer Norseman from F. W. Gilchrist of Alpena, and will use her in the Georgian bay lumber trade. Her capacity is about 500,000 ft.

Hugo & Tims are the lowest bidders for furnishing and driving piles at Superior entry, Superior, Wis. The amount appropriated for this work was $5,000 and Hugo & Tims' bid was $4,931.37.

The second of the Welland canal steamers building at Buffalo for the Great Lakes & St. Lawrence Transportation Co., will be named after Mr. Robert Wallace, the nestor of great lakes ship builders.

It is again reported that the Northern Steamship Co.'s big passenger steamers, North-West and North-Land, will abandon the Chicago route next summer and run between Buffalo and Duluth. They are said to have lost a very large sum of money on the Chicago route last season.

The wreck of the steamer Hebard has been purchased by Capt. R. P. Thompson of Port Huron, and will be raised by him in the spring. The Hebard is on the rocks at Maimaise point, Lake Superior. It is probable that her engines, if they are recovered, will be placed in the old Detroit fire boat, also purchased by Capt. Thompson.

A fair indication of the grain traffic of Buffalo is found in the 1902 report of Supt. Kennedy of the grain elevating department of the Lake Carriers' Association. Mr. Kennedy reports that he handled from vessels to elevators during the year 125,680,750 bushels of grain. This amount is considerable below the Buffalo receipts of either 1901 or 1900.

Lake Tugmen's Protective Association No. 7 of Tonawanda, recently elected the following officers: President, William D. Kropp; vice-president, Charles Bacon; recording secretary, Frank L. Mago; financial secretary, William I. Mago; corresponding secretary, H. E. Shepard; treasurer, Frank Hartman; chaplain, Louis D. Kropp; teller, William Cosgrove; conductor, F. G. Kropp; delegates to grand lodge at Milwaukee, Capt. William D. Kropp, Engineer A. C. Gillie.

The Buffalo Dry Dock Co. is crowded with repair work. Workmen have been taken from the Wolvin boats that are building for St. Lawrence river trade in order to facilitate the work of repairs. This will delay somewhat the launching of the Wolvin boats. The Lehigh Valley liner Mauch Chunk, which was damaged by the fire at the Union Steamboat warehouse, is undergoing extensive repairs, several of her plates necessitating rerolling. The E. C. Pope, the Caledonia and the Vanderbilt are also being repaired.

Capt. D. D. Gaillard, United States engineer in charge of river and harbor work on Lake Superior, is calling for proposals for the work of dredging the trench for the new concrete pier for the south side of the ship canal at the Superior end of the harbor. The estimated amount of the material to be removed is 130,000 cu. yds. The work of building permanent piers at the Wisconsin entry will begin on the south side of the canal. The Wisconsin entry piers will be much longer than those of the Duluth ship-canal. They will be about 3,200 ft. long.

The disablement of the lake-built steamer Minnetonka caused a number of the coast newspapers to scoff at the lake-built vessel. But they may rest assured that the Minnetonka owed her salvation to the excellence of her construction. The storm was by all reports one of the most severe that has been experienced during late years and the Minnetonka's steam and hand steering gear became disabled. Nevertheless she weathered the gale. In point of fact it is the opinion of experts that the Minnetonka, built by the American Ship Building Co. at Cleveland, is better built than she would have been had she been built in England. Her recent experience has demonstrated her solidity and complete seaworthiness. Her steering gear was of standard make and what may have caused its disablement is not known.

LAKE MICHIGAN GRAIN SITUATION.

P. H. Fleming & Co., vessel and insurance agents of Chicago, have just prepared some valuable figures dealing with the matter of winter storage in Chicago and grain freight prospects for next season. In view of favorable crop estimates, they look for a very large amount of grain, with a healthy eastern cash prospect, and they are therefore inclined to think well of the lake freight outlook from the carriers' standpoint, especially as there will probably be no limit to the demand for coal.

They figure first that at Chicago, South Chicago, Milwaukee, Manitowoc and Sheboygan, as well as minor ports on Lake Michigan, the vessel capacity aggregates 10,550,000 bu., but 2,400,000 bu. of this is capacity represented by vessels of the Steel Corporation, which are very probably not available for grain, so that the available capacity in the Lake Michigan fleet is 8,150,000 bu., as against 13,190,000 bushels a year ago. On Jan. 12, 1903, wheat, corn and oats in store at Chicago and Milwaukee aggregated 18,251,230 bu., compared with 21,594,432 bu. a year ago. Thus the grain in store is about 3,000,000 bu. less than a year ago, while there is a reduction of about 5,000,000 bu. in vessel capacity. On Jan. 14 of this year there was but 175,000 bu. of grain afloat, compared with 428,000 bu. on the same date a year ago. In April, 1902, opening of the past season of navigation, there was 2,681,000 bu. of grain afloat. The crop estimate is as follows:

	Jan. 14, 1903.	Year ago.
Wheat	670,000,000	748,000,000
Corn	2,523,000,000	1,522,000,000
Oats	987,000,000	736,808,000
Other grains	198,000,000	169,000,000
	4,378,000,000	3,175,808,000

It will be noted that the estimate shows an excess of a billion bushels in corn at points tributary to Lake Michigan ports, but thus far the movement has been retarded through unfavorable weather conditions and car shortage. The chartering recently of a few vessels on a basis of 2½ cents for spring shipment of corn and wheat to Buffalo (equalling about 75 cents per net ton, free) is generally regarded as satisfactory.

The Canadian crop of 1902 was estimated at 60,000,000 bu., and the shipments at 30,000,000 bu., so that the estimated balance for 1903 spring shipment, on that score, after deducting the probable rail movement, is 20,000,000 bu.

REPORT ON NEW YORK CANALS.

The annual report of the state superintendent of public works of New York has just been filed. Upon the subject of canals the report says:

"The canals as a whole are now only emerging from the chaotic condition in which they were necessarily left as a result of the hastily-started and suddenly-interrupted deepening improvement authorized by chapter 79 of the laws of 1895. That navigation has been maintained with so little interruption during the past four or five seasons, I believe, will be recognized by those familiar with the actual conditions as they have existed as due largely to good fortune. The antiquity of structures leads to an accelerating rate of decay and the best the department can do is to postpone disintegration. The absence of a definitely-understood canal policy has made more difficult the problem of maintenance. There has been a desire, which still obtains, to spend no money in repairs of an elaborate character which would not avail in case of an enlarged or reconstructed canal. The hopeful feeling, which is very general, that the state is very soon to define its policy with respect to future treatment of the canals, and having defined it to enter upon the prosecution of the plans determined upon, encourages me in the belief that the problem involved in what I have here set forth will not have to be met face to face but that it may thus be evaded."

The opening of the canals last year was earlier than in twenty years previous and navigation was maintained until Dec. 4, largely for coal shipments. In spite of the lengthened season the total tons carried was only 3,274,446, as against 3,420,613 tons in 1901, a falling off of 146,167 tons. The loss is more than accounted for in through freight, for whereas there was an increase in way freight east of 84,976 tons the total decrease in through freight was 210,619 tons, the loss being equally divided between eastern and western shipment.

NO MATTRESS FOR CHARLOTTE HARBOR.

Kingston, Ont., Jan 17.—Kingston mariners are rejoiced that the project to build a mattress at Charlotte harbor has been dropped. There are so many vessels carrying coal between here and Charlotte that there is not a Canadian city that the suggested change would have affected as much as it would Kingston. It was a Kingstonian, Capt. T. Donnelly, who wrote the very practical letter appearing in a recent issue of the Review which pointed out how the suggested change would be a risky experiment. At the meeting of representatives of marine interests, held at Rochester on the 15th inst., three Kingstonians were present—C. F. Gildersleeve, manager of the Richelieu & Ontario Navigation Co, H. H. Gildersleeve, manager of the Bay of Quinte Steamboat Co., and Sanford Calvin of the Calvin Wrecking & Forwarding Co. They with the sixty other delegates objected to the change, for while the proposed mattress—to be 600 ft. long and to be 7 ft. under the surface—might do some good by diverting the current of the Genesee river, the long pier would certainly mean the grounding of such steamers as the Toronto, the Kingston, the North King, etc., and would also be a menace to smaller craft, and when he heard the explanation, Maj. Symons, engineer of government improvements in the district, very wisely assured the convention that the mattress would not be built. Instead, the $150,000 government appropriation for improvements in Charlotte harbor will be used along other lines.

A large staff of men are at work in Davis' dry dock lengthening the government boat Scout.

Capt. W. W. Brown, Cleveland owner of a large fleet of steel steamers, has sailed for Europe, to be gone until Mar. 1, His trip is one of business, probably with a view to giving considerable attention to London methods of handling the large amount of hull and cargo insurance that goes over there from the lakes.

GREATNESS OF THE LIGHTHOUSE INSTITUTION.

No country on earth spends anything like the amount of money that is spent by the United States for lighthouse purposes. For maintenance alone the appropriations turned over to the lighthouse institution by congress now amount to about $4,000,000 annually. All this aside from the very large appropriations that are continuously being made for new lighthouses and other aids to navigation, and aside also from the fact that the item of maintenance includes no charge for supervision of the service, which is in the hands of officers of the army and navy. There is no charge to the shipping interests of this country for this service, excepting as they contribute to the general cost of government, and the light dues charged to foreign vessels might well be called nominal in view of the very large portion of our foreign shipping that is conducted in foreign bottoms.

The latest report of the United States lighthouse board shows that on June 30, 1902, there were under control of that establishment 9,767 aids to navigation, divided as follows:

Lighthouses and beacon lights	1,332
Light-vessels in position	45
Light-vessels for relief	9
Electric-lighted buoys in position	11
Gas-lighted buoys in position	102
Fog signals operated by steam, caloric, or oil engines	188
Fog signals operated by clockwork	231
Post lights	1,830
Day or unlighted beacons	859
Whistling buoys in position	84
Bell buoys in position	127
Other buoys in position	4,949
Total	9,767

In the construction, care, and maintenance of these aids to navigation there were employed:

Steam tenders	35
Steam launches	11
Sailing tenders	2
Light keepers	1,429
Officers and crews of light ships and tenders	1,348
Laborers in charge of post lights	1,412
Other employes	591

As showing exactly the expenditure involved in maintenance it may be noted that for the present fiscal year, to end June 30, 1903, the appropriations from congress aggregate $3,701,013; this in addition to the appropriation in the same year of $978,104 for new works. The items involved in maintenance are:

Supplies to lighthouses	$ 475,000
Repairs to lighthouses	670,000
Salaries of light keepers	800,000
Expenses of light vessels	500,000
Expense of buoyage	550,000
Expenses of fog signals	190,000
Lighting of rivers	300,000
Survey of lighthouse sites	1,000
Oil houses for light stations	10,000
Porto Rican lighthouse service	75,000
Maintenance of lights on channels of the great lakes	4,000
Alaskan waters	126,013
Total	$3,701,013

The number and kind of lights and other aids employed in different sections of the country on June 30, 1902, will be found in the following table:

Aids.	Atlantic coast.	Pacific coast.	Lake coast.	Western rivers.	Total.
Electric lights	4	....	....	.....	4
First-order lights	40	18	....	.....	58
Second-order lights	16	1	3	.....	20
Third-order lights	36	5	24	...	65
Three-and-one-half-order lights	3	..	8	.....	11
Fourth-order lights	185	21	95	.....	301
Fifth-order lights	108	7	44	....	159
Sixth-order lights	57		47	....	104
Lense-lantern lights	160	31	101	...	292
Range-lense lights	16	.....		.....	16
Reflector lights	56		7		63
Post-lantern lights	432	125	126	1,424	2,107
Light-vessels in position	32	3	10	.....	45
Electric-lighted buoys	11	.....		.....	11
Gas-lighted buoys	35	....	67	.....	102
Total lighted aids	1 191	211	532	1,424	3,358
Fog-signals operated by steam, hot air, or other engines	78	34	76	....	188
Fog-signals operated by clockwork	198	15	18		231
Day beacons	450	97	1	311	859
Whistling buoys	57	27	.....		84
Bell buoys	109	15	3	...	127
Other buoys	3 923	364	633	.....	4,920
Total unlighted aids	4.815	522	731	311	6.409
Total number of aids	6,006	763	1,263	1,735	9,767

J. J. HILL ON NORTHWESTERN TRADE.

Speaking last Saturday night at the reception of the Commercial Club of St. Paul to Hon. Clifford Sifton, Canadian minister of the interior, Mr. James J. Hill, president of the Great Northern railway, had this to say of northwestern trade:

"We have settled some questions in this country in such a way that no other nation thinks our settlement at all permanent. For instance, land transportation: In Great Britain it costs $2.35 an average to haul a ton of freight one hundred miles. On the continent it costs about $1.90. In the United States it costs 70 cents, and we pay four times the wages they pay. We furnish the transportation for a little more than one-third of the average of Europe and still we are hardly happy. Sometimes we would like to furnish it for nothing, but it cannot be furnished for nothing. A railroad is a great deal like the French cook, when they asked him what he wanted to make soup. 'Oh, anything.' 'Well, what?' 'Well,' he said 'a joint, a piece of mutton, a bone, the heel of an old shoe; I must have something, but I cannot make it out of nothing.'

"The amount of traffic has grown to an extent that east of Chicago the railroads cannot carry the business. You could not go to Minneapolis and make a contract to get a carload of flour or a trainload of flour delivered in New York, a contract that you could enforce in thirty days, because nobody knows what time it will take, the traffic is so great. Now, there are two ways that the traffic of the west, growing as rapidly as it is growing, can find its way to market. One is down the Mississippi to the Gulf of Mexico. That is active today. Grain sells as high for the last year, as a rule, in Kansas City, as it sells in Chicago, simply because it can go out by the Gulf of Mexico. People are afraid now to send their grain east by the trunk lines, afraid they may not get it until next spring. The other is by way of the St. Lawrence. If the St. Lawrence system was improved, as it might be, it would take the great bulk of our export business from this portion of the west, and from all portion of the west near the great lakes."

THAT NEW CANADIAN ORE DEPOSIT.

Concerning the report of the discovery of an iron ore deposit in Canadian territory 30 miles northeast of Sudbury, Prof. A. P. Coleman, a Toronto geologist in the service of the Ontario bureau of mines says:

"The mine in Hutton township has been called the Moose Mountain by Charles Osborn of Sault Ste. Marie, Mich., who owned it at the time of my visit. The part I visited was on lot 9 of the fourth concession of Hutton. The deposit consists of magnetite, inbanded with some silica, but it is much richer in magnetite than the iron range is in general. When I was there the ore body had been stripped for 270 ft. in one part and 300 ft. in another and about 25 to 30 ft. wide. The ore seems free from pyrites, or nearly so, but contains some silicate. The hill is about 180 ft. high and probably the ore will be found to have at least that depth. There is no reason to suppose it does not go much deeper. I think if you took the whole range there is very much more ore there than in the Helen mine but it is uncertain if it is all of a grade that could be worked. I was told that the best ore would go about 60 per cent. in iron but how much of the ore I saw disclosed would run that high I do not know. A somewhat siliceous magnetite, such as this, is not the choicest of ore. It is not usually as highly esteemed as hematite."

PINTSCH SYSTEMS.

The Pintsch buoy system is now applied to 240 buoys and beacons in the United States, Canada and Mexico. This is noted in information from the Safety Car Heating & Lighting Co. of New York, regarding the very large increase in their business during 1902.

During the year 2,051 cars were equipped with the Pintsch light in the United States, Canada and Mexico. Seventy-five gas buoys were purchased by the lighthouse departments of the United States and Canada, and 1,811 cars were equipped with the New York company's standard steam heating systems.

The Pintsch lighting system has been adopted by over 200 railroads in the United States, Canada and Mexico, where it is applied to 20,017 cars. The steam heating systems of this company are adopted by 130 railroads in the United States and are applied to 11,050 cars.

Up to Oct. 1, 1902, the Pintsch system has been applied to 116,000 cars, 5,000 locomotives and 1,500 buoys and beacons in the world. The simplicity of operation and economy in maintenance of the Pintsch system has been so satisfactory that it has practically been adopted as the standard lighting system by the majority of the railway lines and the lighthouse establishments of the world.

Reports from the blast furnaces of the country certainly contain no indication of a falling off in the enormous demand that has so long existed for iron and steel products throughout the country. On Jan. 1 the production was again in excess of all previous records. The plants running on that date were able to make 354,684 gross tons of pig iron per week, the highest previous record having been 352,064 gross tons on May 1 1902. Official reports regarding pig iron production in the year 1902 are not yet complete, but close estimates place the aggregate at a little less than 18,000,000 gross tons.

AWARD TO CRAMPS PROTESTED.

The recommendation of the naval board of construction that the contracts for the two new armored cruisers Tennessee and Washington be given to Cramps has caused a protest to be filed by other bidders. The New York Ship Building Co. is especially hostile to the recommendation of the board and has sent the following letter to Secretary of the Navy Moody:

"The report of the board of naval construction has just come to our attention. We formally protest against the recommendations of the board to award the contract to the William Cramp & Sons' Ship & Engine Building Co. for the following reasons:

"First—The bids were made by formal proposal, sealed, delivered and opened at a certain time in accordance with the advertisement, circular and instructions to bidders.

"Second—The attempted offer of the Cramps company to substitute Babcock & Wilcox boilers at the price of their inferior plans, viz., $3,000,000, is a violation of the conditions under which we were invited to bid, and would be, if considered, a new bid. The changing of the plans to secure the contract under the low bid is practically the same as changing the price for the government plans to $4,000,000.

"Third—The government of the United States cannot, with becoming dignity nor in good faith to bidders who have at great expense and trouble submitted tenders under government specifications, permit a substitution of prices or alteration of plans prior to awarding of the contract by the government.

"Fourth—To allow the substitution of plans or prices would be grossly unjust to the lowest bidder, because it would permit of an unfair practice of putting in all sorts of alternating bids to test the position of a bona fide bidder following the requirements and conditions, and would ultimately become a source of much embarrassment to the government itself in reaching its decisions.

"Fifth—Neither should such practice be permitted for the purpose of forcing a reletting, because it would give other bidders an unfair advantage, the prices having been made public.

"Sixth—No amount of precedent on the part of the department nor argument that such changes of plans and reduction of prices are favorable to the interests of the United States can be maintained as just; involving, as they would, the favoring of one bidder to the great detriment of the other. Should the Cramp company's bid of $4,000,000 each (which specifies Niclausse boilers) for the two cruisers be accepted, with the intention of subsequent substitution of Babcock & Wilcox boilers, it would be unjust to all bidders and would destroy the intent in asking for sealed proposals.

"Seventh—The board's recommendation that the contract be awarded to the Cramp company on account of a shorter time of completion is not justified by past experience, as the Cramp company has never built a cruiser or battleship within the specified time. The New York Ship Building Co. has better facilities than any other ship yard in the United States, and constructs these cruisers within the shortest possible period.

"Eighth—The New York Ship Building Co. is the lowest bidder on plans acceptable to the government and was known to be in full operation and fully equipped at the time of making the bid to turn out the cruisers in the least possible time, and, having a capacity much larger than any other bidder, should be allowed to get its share of the work, so that every large ship yard in the country with proper capacity may be familiar with the construction of government work, in order that in case of war the full resources of the country may be used by the government.

"Ninth—If a bona fide bidder cannot secure a contract with the government by the ordinary, plain, straightforward method of tendering according to the instructions to the bidders and form of proposal, such bidder would naturally be reluctant to bid again, especially if the government, through a false method to economize, should lend itself to such practices."

The letter is signed by Mr. Henry J. Morse, president of the New York Ship Building Co., who says an important public question is involved in the controversy.

WANT THE ALLEN LAW RE-ENACTED.

The Atlantic Coast Seamen's Union has become so powerful in New York, according to the ship masters engaged in the coastwise trade, that skippers are compelled to pay ordinary seamen in some cases as high as $5 per day for the run to Boston; and otherwise the situation, the ship masters say, has become so intolerable that they have taken measures to bring to the attention of this session of congress the Allen bill for the re-enactment of the old legislation bearing upon the enforcement of the sailor's contract, which has lain in committee since its presentation in congress last year. In 1898 the law, which has existed for a century, was superceded by experimental legislation aimed at the crimping system and other abuses which the American sailor was suffering under. The skippers say that the experience of the past four years has shown that the new law has put them entirely at the mercy of the sailors, and that it defeats its own purpose as far as crimping is concerned. In a circular stating their grievances, which the ship owners have issued, they say:

"Crews shipped before United States commissioners are transported at their employer's expense to the port where the vessel is waiting, and then refuse to go on board until extra money has been paid them. As the law now stands, there is no redress; for the sailor is the one class which the law specially exempts from the penalties of obtaining money under false pretenses. Men ship for a round trip, take the vessel from a port where crews are plenty, and as soon as she touches where crews are not to be obtained without great delay and expense, desert; and in many cases vessels after being delayed at great loss and remaining many times in peril, have been compelled to pay exhorbitant bounties—sums like $25 per man for a three days' sail. The fact that the existing law makes it impossible for the vessel to discharge a signed crew without incurring severe penalties, while the sailors may desert with impunity whenever they can reach the shore, demonstrates clearly the injustice of the present law."

Under the old law a sailor who deserted or even refused to join a vessel he had signed to serve on, could be arrested without warrant and brought aboard. The ship masters want this re-enacted, or a similar law passed which will give them some sort of a hold on their men.

NOTES FROM NEW YORK.

New York, Jan. 21.—Messrs. Wynant & Eiswald, naval architects of 15 Whithall street, New York, and also of Providence, R. I., are, in addition to their other business, designing the two vessels for the quartermaster's department of the army, the contract for building which has been awarded to the Perth Amboy Ship Building & Engineering Co., of Perth Amboy, N. J. These vessels will be similar to the Gen. Meigs, now in service in New York harbor, and will be fitted with compound engines. Each will be supplied with two Scotch boilers and an enlarged electric generating set which will include a 13-in. projector.

The arrangements, as laid out, provide for a large saloon aft, on the main deck, with the waste of the vessel enclosed for the accommodation of troops in transport. The upper deck will be provided with pilot house and chart room, with officers accommodations immediately aft, while in the fore hold ample space is provided for freight. It is the intention to build these vessels so that when completed they will receive the highest rating known in the American Bureau of Shipping. They are to be finished throughout to compare favorably with some of the later built yachts. The contract calls for their delivery to the government in the early summer of the present year.

There is more or less comment being indulged in by ship builders along the Atlantic coast, at the present time, on the wide difference as to price and time limit for building government vessels. That such should be the case is not to be wondered at in view of the bids lately opened in the depot quartermaster's office in this city by Maj. I. W. Little, acting quartermaster for furnishing two steel vessels for harbor service of the depot quartermaster's office, as these bids ranged from $52500 to $94,083 in price per vessel, and from 130 to 300 days for delivery, as follows: Baltimore Ship Building & Dry Dock Co., one vessel, bidder's specifications for engines, $94,083, or two vessels, $91,000 with delivery in 152 days for one vessel and 204 days for the two; Townsend & Downey, $89,700, with delivery in 230 days for one and 270 days for two; New York Ship Building Co., $85,400, delivery of one vessel in eleven and two in twelve months; Crescent Ship Yard, $86,500, delivery of one vessel in 180 and two in 210 days; Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, one vessel, $87,300, or two $84,000 each, with delivery of one vessel in 130 and two in 160 days; T. S. Marvel & Co., one vessel at $83,000, or two at $81,000 each, with delivery of one vessel in eight months and two in nine months; Marine Construction & Dry Dock Co., one vessel, $74,225, delivery in 275 days; Perth Amboy Ship Building & Engineering Co., one vessel, $54,000, or two vessels at $52,500 each, with delivery of one vessel in 120 and two in 130 days. Where time is given in days it means so many working days. Thus it will be seen there is room for comment as the bids on this class of vessel should not vary in price and delivery time as here shown.

The New York Asbestos Co. has built a new and enlarged plant at Payntar street and Van Alst avenue, Long Island City, which is equipped with all the latest machinery and appliances for turning out the company's finished product, the leading staple of which is asbestos aircell sectional coverings for steam pipe, etc. The company expects to move from its present plant in Brooklyn, which the business has largely outgrown, to the new plant about Feb. 1.

The American Line steamship St. Louis reached New York on Saturday last, six days overdue. There was never the least doubt of the steamer's safe arrival but her non-arrival on time made a number of persons very nervous. The cause of the delay was the inability of the boilers to supply the requisite amount of steam, so that the steamer scarcely made 50 per cent. of her normal speed. There appears to have been no discomfort aboard; there was sufficient of everything: the steamer was never for an instant in danger; but a number of the passengers felt it incumbent upon themselves to pass a series of resolutions condemning the management of the line. The steamship was late and that was merely all there was to it.

FIFTEEN HUNDRED ROBERTS BOILERS.

Among the water-tube boilers of a marine kind made in this country there is one that is being put into steam craft of all kinds by the hundred each vear without fuss and without the contentions and troubles of the big organizations that are dealing with the navies of the world. We refer to the boiler made by the Roberts Safety Water-Tube Boiler Co. of 39-41 Cortlandt, New York, of which nearly 1,500 are now in use. "Illustrated Opinions" is the title of a very neat and practical pamphlet just issued with reference to this boiler. As the management of the Roberts company puts it, they have now given out in a series of publications about all that is required regarding their boiler. First there is a general illustrated circular, then an illustrated construction circular and a direction circular, and now "Illustrated Opinions."

This latest pamphlet is of about 100 pages and is filled with photo-engravings of steam vessels of various kinds that are using Roberts boilers successfully. In conjunction with the illustrations of the vessels, photographic copies of letters, including the letter-heads, are shown, and they tell of the success and satisfaction with which the boilers are being used. As near as it is possible to do so, the letters and the pictures of the vessels to which they refer have been placed on pages opposite each other. In the first part of the pamphlet will be found a list of representative customers of the company, selected from the hundreds whose names appear on their books, as being the most competent to give opinion on the subject under consideration and whose recommendations carry most weight. It would, of course, be impractical to put through the mails in very large numbers a book dealing with all the vessels to which boilers have been supplied, or even a list of these vessels, their owners, builders, etc., with such other information as is published regarding the selected list. The snips and engine builders of the country are almost entirely represented in the list. The Roberts company keeps for inspection at its New York office a complete list of purchasers of their boilers with all necessary information regarding each boiler.

Among customers of the company, many of the names appearing in connection with repeated orders for installations of this boiler, are the following: Bath Iron Works, George Lawley & Sons Corporation, Fore River Ship & Engine Co., Crescent Ship Yard Co., Morse Iron Works & Dry Dock Co., Marine Iron Works, Union Iron Works, Moran Bros. Co., Craig Ship Building Co., Col. John Jacob Astor, Mr. Harrison B. Moore of the New York Lighterage Co., Commodore J. B. Simpson of Lake George, N. Y., Mr. Frank B. McQuesten of Boston Mass., the Centennial Transportation Co., Capt. Jos. Jenks of Ossining, the supervisor of the harbor of New York, Messrs. Hughes Bros. & Bangs, the Osgood Dredge Co., treasury department, war department, lighthouse board, Mr. Henry R. Stick of Portland, Me., Mr. John Einig of Jacksonville, Fla., the Merrill-Stevens Engineering Co., the Fayetteville & Wilmington Steamboat Co., the Sheridan Iron Works, Cummber Lumber Co., Mr. E. W. Bliss of Brooklyn, N. Y., the Spedden Ship Building Co., the Waterbury Brass Co., Mr. Wm. R. Osborne of Croton-on-the-Hudson, N. Y., the Johnson Iron Works, etc., etc.

Officials of the company report that books showed on the first of the year that they had exceeded their best previous year by over 100 per cent.

DIXON'S GRAPHITE

The Joseph Dixon Crucible Co., Jersey City, N. J., has issued a tasty booklet devoted to the uses of Dixon's graphite for automobiles. The booklet is bound in bluish gray and while the type matter is in black upon a cream colored base the margins are in terra cotta. Upon the subject of Dixon's motor-chain compound the booklet says:

"At the suggestion of many automobilists who realize the necessity of proper lubrication for motor chains we have carefully investigated the requirements, and after a thorough test have placed on the market Dixon's motor-chain compound. The chain is the connecting link between power developed and work done, and high efficiency of other parts of the machine counts for nothing when the chain ceases to perform its functions properly. The severe strains to which the chain is subjected under conditions of constant exposure to dust and dirt render the matter of its proper lubrication quite a difficult one. Each particular link requires as much consideration as the chain as a whole, because, 'the whole is no stronger than the weakest link.' The Dixon's cycle chain graphites, which have been on the market for years, have given unusual satisfaction for the uses for which they are intended—that is, the exterior lubrication of chains. But the heavy chains of the automobile need something more than this outward application. They need a treatment which will go to the very innermost wearing surfaces of the pivots. This treatment is supplied by the use of Dixon's motor-chain compound, an article which we know will give most excellent satisfaction. It is composed of a mixture of Dixon's No. 635 special lubricating graphite with mineral and animal lubricating materials and made into hard oblong cakes weighing about 3 lbs."

The New York Marine Society held its annual meeting in the Produce Exchange building, New York, recently and elected the following officers: Capt. A. J. Newbury, president; David A. Scribner, B. F. Marsh, vice-presidents; J. H. Chamberlain, treasurer; G. W. Tucker, secretary, and Alfred H. Joline, counsel.

"KEARSARGE"
ASBESTO-METALLIC
PACKINGS

Made from pure Asbestos yarn and fine brass wire, firmly woven together

GASKETS
will not blow out, will hold against any steam pressure, will stand highest temperature.

Used exclusively on the hand holes of Babcock & Wilcox and other water-tube boilers.

SHEET PACKING
The most reliable flat packing on the market for all conditions of steam service

PISTON ROD PACKING
For high speed, high temperature, high pressure, with or without wire interwoven.

FLANGE JOINT GASKETS
More reliable than rubber or metallic and cost much less. Will not blow out. Unaffected by high temper ture. Without expansion or contraction. Works perfectly whether conditions are favorable or unfavorable.

Write for samples, prices and full information.

H. W. JOHNS-MANVILLE CO.
100 William Street
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MILWAUKEE CHICAGO ST. LOUIS BOSTON PHILADELPHIA CLEVELAND PITTSBURG NEW ORLEANS LONDON

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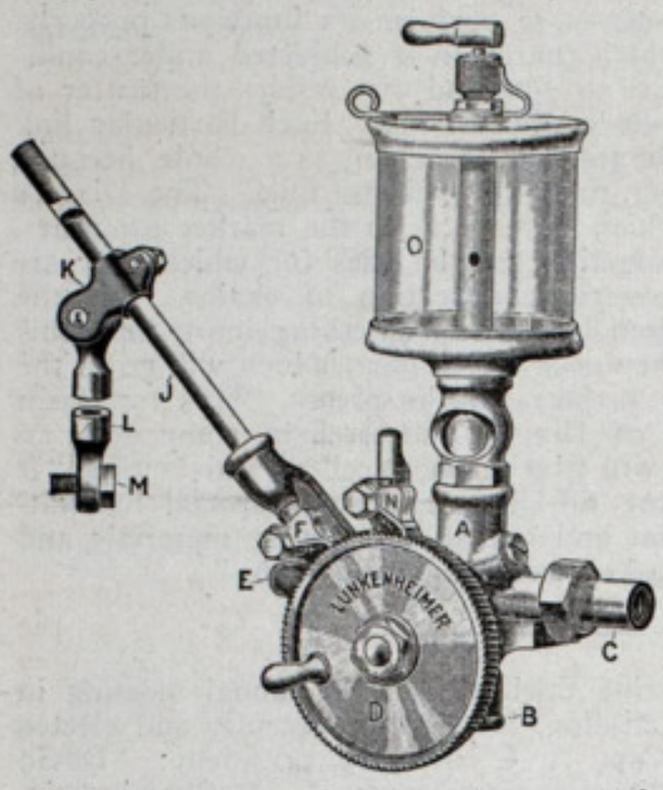
FACILITIES FOR REPAIRS OF STEEL AND WOODEN VESSELS.
DRY DOCKS AND MAIN OFFICE: MANITOWOC, WIS.
GEO. B. BURGER, SUPT.
BRANCH YARD: 34 ROBERTS STREET, CHICAGO.
THEODOR KNUDSON, SUPT.

United Marine Mfg. & Supply Co.,
MANUFACTURERS OF AND DEALERS IN
ELECTRICAL MATERIAL
FOR SHIPS AND FORTIFICATIONS.
ALBERT C. JAHL, General Manager,
100 William St., New York, U. S. A.

MECHANICAL OIL CUP.

A view of a mechanical oil cup, made by the Lunkenheimer Co., Cincinnati, is presented herewith. The manufacturers say they have in this device a positive mechanically-operated lubricator, the result of a great deal of study and experiment. "This method of lubrication," they say, "is more reliable than that obtained by lubricators hydrostatically operated, and, when properly constructed, the oiling is absolutely positive, and all of the oil fed to the pump is bound to be forced to the steam chest or cylinder of the engine." The cup is thus described:



The driving mechanism is of the ratchet type and is operated by the clutches (F) and (N) that work co-operatively by the motion of the rod (J) which can be attached to the eccentric rod, or other moving parts of the engine, by the couplings (K) and (M). The motion thus obtained is transmitted to the piston (E) by the crank-pin mechanism (H) and (G). The rachet wheel (D) is provided with a handle whereby it can be rotated by hand in case it is desirable to force a quantity of oil at any time, as, for example, when starting the engine. By moving the part (K) up or down the rod, the stroke of the pump can be lengthened or shortened, as desired, thus regulating the amount of oil fed by the pump independent of the feed from the oil cup. The joints of the cup are tight, the sight-feed glass being packed so as to prevent the access of air that would have a tendency to cause the cup to feed after the engine had ceased running. This construction and the use of check valves in the pump prevent oil supply from flooding. The outlet (C) is piped to the steam pipe or chest of the engine, and the spring check valve (X) should be placed as near the end of the pipe as possible, preferably into the steam pipe. The bottom of the pump body (B) is tapped ½-in. pipe thread to receive a stand so that it can be placed wherever desired. The pump is substantially constructed and as the parts are made to jigs and templets, they can all be easily renewed, being perfectly interchangeable. The rachet wheel (D) and pawls (F) and (N) are made of tool steel, tempered and hardened. All other metal parts about the pump are made of the very best hard bronze composition.

Messrs. Masters, Smith & Rutherford, 29 Broadway, New York, have added to their business of naval architects and engineers, that of marine surveying and salvage operating.

Boiler and Engine For Sale.

Both in first-class condition. Boiler 10½ ft. in diameter and 14 ft. long; 120 lbs. steam allowed. Fore and aft compound engine; high-pressure, 22 in. diameter, low-pressure, 44 in., with 36 in. stroke. Address Barry Trans. Co., East End Michigan st., Chicago, Ill. Jan 22

Steam Barge for Sale.

Steam barge for sale, half or whole. Rates A-2. Capacity 700,000 ft. of lumber. Light draught; 120 lbs. of steam. For particulars apply to J. E. Miller, 23 Lodge avenue, Cleveland, O. Jan. 22

Sealed proposals will be received at the office of the Light-House Board, Washington, D. C., until 2 o'clock p. m., February 21, 1903, and then opened, for furnishing the materials and labor of all kinds necessary for the construction and delivery of the twin screw steel, steam light-house tender Ivy, delivered at the light-house depot, Key West Fla. Blank forms of proposal, specifications, and other information may be had upon application to the office of the Light-House Board. GEORGE C. REMEY, Rear-Admiral, U. S. N., Chairman Jan. 29

U. S Engineer Office, Grand Rapids, Mich., Jan. 20, 1903. Sealed proposals for repair of piers at St. Joseph and Black Lake, Mich., will be received here until 3 p. m., Feb 19, 1903, and then publicly opened. Information furnished on application. CHARLES KELLER, Capt., Engrs. Feb. 12.

U. S. Engineer Office, Duluth Minn., Jan. 19, 1903. Sealed proposals for pier work and dredging at Port Wing, Wis., will be received here until noon. Feb. 19, 1903, and then publicly opened Information on application. D. D. GAILLARD, Capt., Engrs. Feb. 12.

BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (AUGUST, 1902)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	268,020 H. P.
English Royal Navy	745,900 "
Russian Imperial Navy	18,900 "
Japanese Imperial Navy	110,700 "
Austrian Imperial Navy	32,900 "
Italian Royal Navy	13,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Total Horse Power of Boilers in Use	1,501,520

WORKS: Ateliers et Chantiers de l'Ermitage, at Saint-Denis (Seine), France.

TELEGRAPHIC ADDRESS: Belleville, Saint-Denis-Sur-Seine.

NAVAL ITEMS.

The submarine torpedo boat Pike was launched last week from the yard of the Union Iron Works, San Francisco, Cal.

Naval Constructor Richmond Pearson Hobson has been assigned to duty at the Puget Sound navy yard. Mr. Hobson has been trying to get on the retired list for several months past but without success.

The naval bill to be introduced in congress will provide for an increase in the construction corps of twenty-nine officers, not more than five of whom may be appointed in any one year. At present the constructors in the navy department are under great stress and have more work to do than they should properly be entrusted with.

Five men were killed and four others were injured by an explosion in the breech of the aft starboard 8-in. turret gun of the battleship Massachusetts on Saturday last. Rear Admiral Charles O'Neil, chief of the bureau of ordnance, showed great interest in the report of the accident and expressed the fear that the cause might never be known. He ventured the opinion that the charge was not in the gun when it was ignited.

The Union Iron Works of San Francisco has followed the example of the New York Ship Building Co. in asking the secretary of the navy not to follow the recommendation of the board of construction that the contracts for building the armored cruisers Washington and Tennessee be awarded to the Cramps, Philadelphia. The Union Iron Works filed a brief in which it was argued that the change made by the Cramps in their bid, in order to make it conform to the views of the board of construction, was not permissible under the law, which, it was held, required the acceptance of bids as they were made at the time of the formal opening. It is contended by the Union Iron Works that as its bid for one vessel was less than 4 per cent. higher than the lowest Atlantic-coast bid for one vessel it is entitled to the contract for one vessel under the provision of the naval act, which gives the advantage of that percentage to Pacific coast bidders. The Union Iron Works also asks if it is wise to award a contract for one vessel to the New York Ship Building Co. which has never constructed a warship?

An argument in favor of the adoption by the United States navy of a new type of torpedo boat was presented before the naval board of construction last week by C. L. Hargar, a New York patent attorney, who is the inventor of the craft, and H. A. Herbert, former secretary of the navy, who is Mr. Hargar's counsel. The vessel is called a sub-surface torpedo boat. It consists of two parts, one partly exposed above water and the other part submerged. The upper part is like the exposed portion of a Holland submarine boat running on the surface. It is filled with cellulose and is said to be incapable of sinking or of being destroyed by gunfire. The machinery and torpedo apparatus are in a fin-like arrangement attached to the upper body and entirely beneath the surface. The upper body does not become entirely submerged. The claimed merits of the craft are the entire protection of the machinery and torpedo apparatus through being entirely beneath the water, the small surface presented by the above-water body, and the absence of the danger of the craft being sunk through gunfire against the exposed portion which would be held up by the lower body even if the cellulose did not expand sufficiently to close the wounds on the waterline. The board reserved decision.

SOME 1903 CALENDARS.

The Waterbury Brass Co., Waterbury Conn., reproduces the painting "Nearing Harbor" as the central part of its calendar.

The calendar which the John A. Roebling's Sons Co., Trenton, N. J., has issued contains a view of the cable construction of the new East River bridge, which the Roebling's are building. In connection with the calendar the Roebling's advertise their ropes, cables and wires.

The Christensen Engineering Co., Milwaukee, Wis., has issued two calendars this season—both of them marines in the three-color process. Both, too, are moonlights and are more than usually attractive. The more one studies this process of printing the more he is amazed that so much can be done in three impressions.

The C. W. Trainer Mfg. Co., No. 89-91 Pearl street, Boston, Mass., has issued a calendar which is very serviceable—that is one may hang it across the room and not strain his eyes to decipher the day of the month. Incidentally Carey's 85 per cent. pure magnesia, sectional, plastic and block coverings, asbestos materials and hair felt are advertised.

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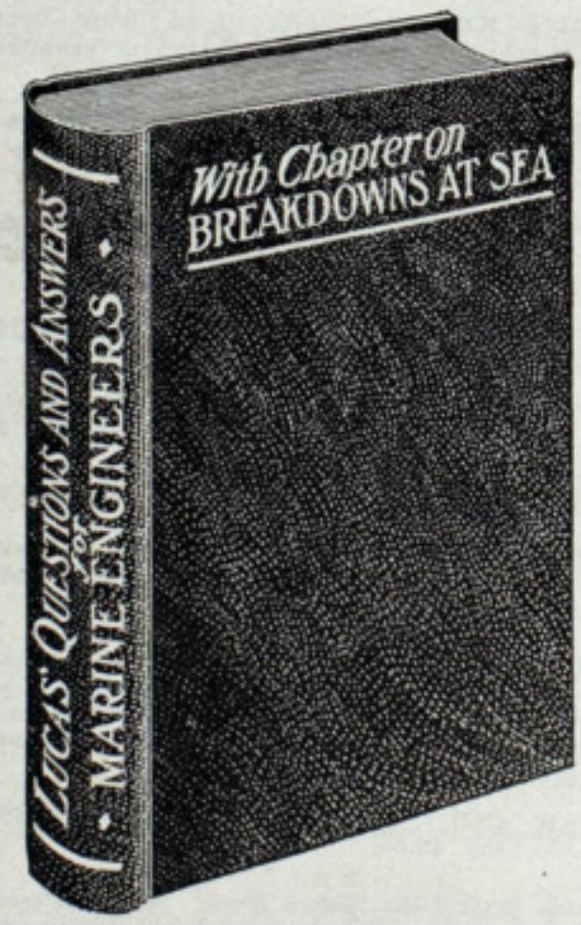

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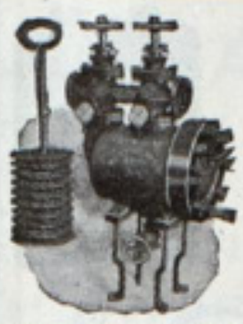

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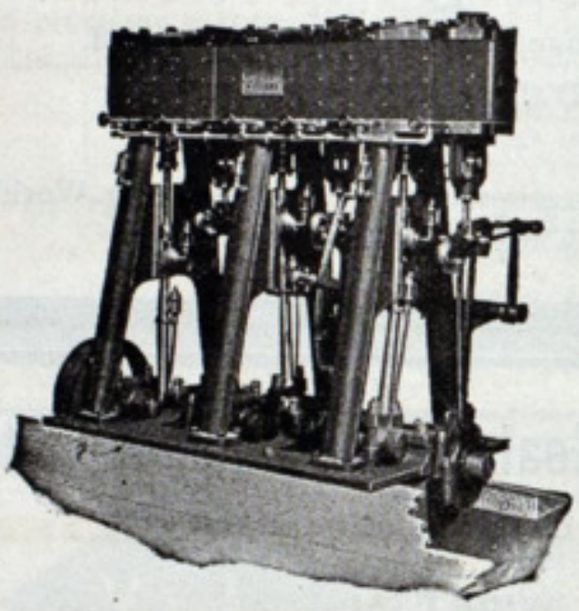

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U. S. Engineer Office, 1637 Indiana Ave., Chicago, Ill., Jan. 8, 1903 Sealed proposals for dredging in Calumet River, Ill., will be received here until 12 noon, February 10, 1903, and then publicly opened. Information on application. O. H. ERNST, Lieut.-Col. Engineers. Feb. 5.

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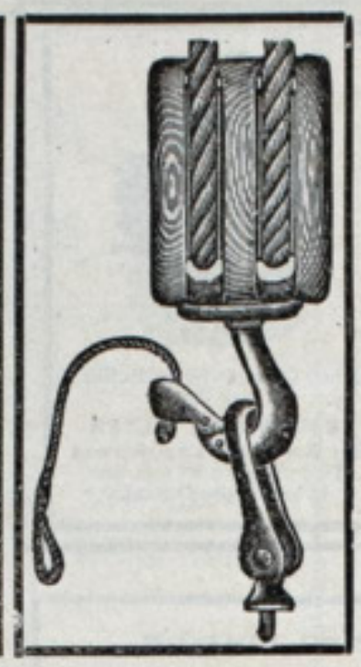

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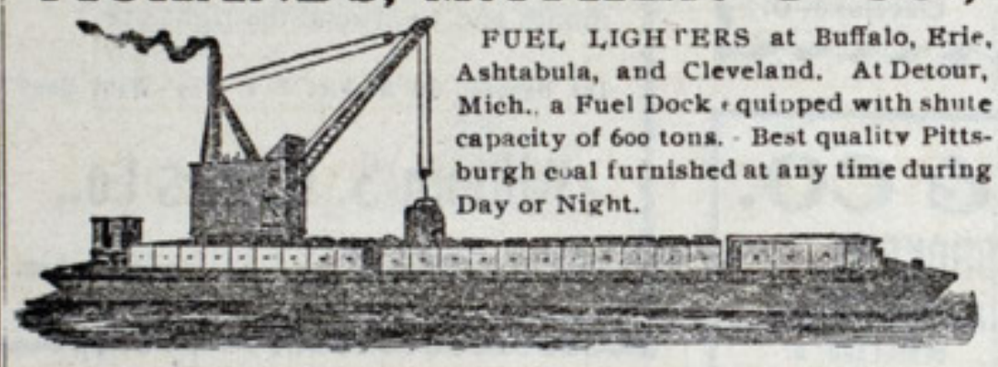

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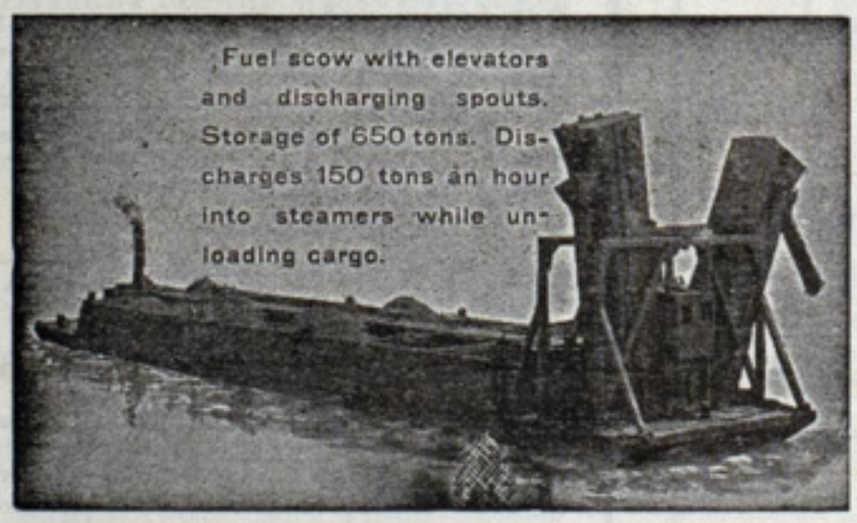

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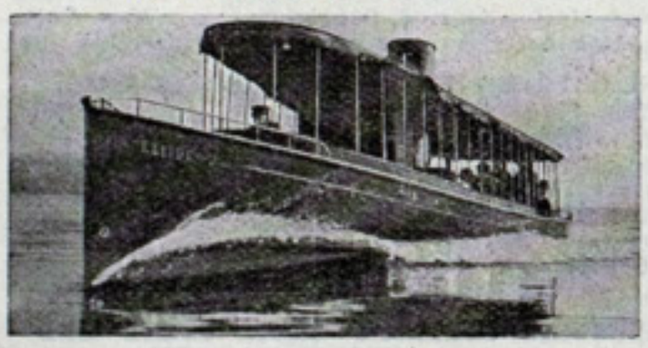

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BRIDGES, BUILDERS OF

Scherzer Rolling Lift Bridge Co. .....Chicago.

BUCKETS, ORE AND COAL.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting & Conveying Machine Co. Cleveland.
Lake Erie Boiler Works.....Cleveland.
Webster, Camp & Lane Co.....Akron, O.

CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co.....Cleveland.

CAPSTANS.

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co. .....Bath, Me.

CAST IRON PIPE.

Wood & Co., R. D. .....Philadelphia.

CEMENT, IRON, FOR REPAIRING LEAKS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

CHAINS.

Lebanon Chain Works.....Lebanon, Pa.
Standard Chain Co. .....Pittsburg.

CHAIN HOISTS.

Boston & Lockport Block Co. .....Boston, Mass.
Dake Engine Co,.... .....Grand Haven, Mich.

CHARTS.

Marine Review Pub. Co .... Cleveland
Potter, J. D..... .....London

CIRCULATOR, EQUILIBRIUM,

With Steam Heating Attachment.

Bloomsburg & Co., H. .....Baltimore, Md.

CLOCKS (Marine), CHRONOMETERS, BELLS.

Ashton Valve Co. .....Boston.
Bliss, John & Co. .....New York.
Chelsea Clock Co. .....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Castner, Curran & Bullitt .....Boston.
Graham Coal & Coke Co., Ltd.....Detroit
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.

COAL AND ORE HANDLING MACHINERY.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting Machinery Co., (Inc.)...Cleveland.
Lidgerwood Mfg. Co.....New York.
Webster, Camp & Lane Co.....Akron, O.

COMPASSES.

Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

CONDENSER TUBE PACKING.

Allen, Joseph .....Collingswood, N. J.

COPPER, TIN AND SHEET IRON WORK.

Lake Erie Boiler Works.....Cleveland.
McCutcheon, C. H.....Buffalo.
Topky Brothers .....Ashtabula, O.

COPPER—SHEET, TUBES AND ROD.

Waterbury Brass Co.....New York.

CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co. ....Pittsburg, Pa.
Kahnweiler's Sons, D. ....New York.
Lane & DeGroot .....Long Island City, N. Y.

CORRESPONDENCE SCHOOLS.

Chicago Nautical School.....Chicago.

CHAIN CONVEYORS, HOISTS.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting Machinery Co., (Inc.)...Cleveland.
Chicago Pneumatic Tool Co. .....Chicago.
General Electric Co. .....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Q. & C. Co. .....Chicago.
Westinghouse Electric & Mfg. Co. .....Pittsburg.
Wood & Co., R. D. .....Philadelphia.

DEAD-LIGHTS, AIR-PORTS, ETC.

"Long-Arm" System Co. .....Cleveland.

DRAWING MATERIALS.

Schwencke, Kirk & Co.....New York.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A. .....New York.

DRILL PRESSES—DRILLS OF ALL KINDS.

Cleveland Punch & Shear Works Co. ....Cleveland.
Q. & C. Co. .....Chicago.

DRYING APPARATUS.

Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co. .....Boston.

DRY DOCKS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building Dry Dock Co...Baltimore.
Bath Iron Works, Ltd. .....Bath, Me.
Buffalo Dry Dock Co. .....Buffalo.
Chicago Ship Building Co. .....Chicago.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
Detroit Ship Building Co. .....Detroit.
Harlan & Hollingsworth Co. ....Wilmington, Del.
Lockwood Mfg. Co. .....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Marine Construction & Dry Dock Co. ....New York.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Newport News Ship Building Co. Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Shipowners Dry Dock Co. .....Chicago.
Superior Ship Building Co.....Superior, Wis.

ELECTRIC HOISTS AND CRANES.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co. ..Pittsburg, Pa.

ELECTRIC FIXTURES AND APPLIANCES.

General Electric Co. .....Schenectady, N. Y.
Page Bros. & Co. .....Boston.
Seidler-Miner Electric Co. .....Detroit.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

ELECTRIC LIGHT AND POWER PLANTS.

Buffalo Forge Co. .....Buffalo.
Electro-Dynamic Co. .....Philadelphia.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co.....Detroit.
Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

ELECTRIC STEERING GEAR, SPEED AND RUDDER INDICATORS, ETC.

Electro-Dynamic Co. .....Philadelphia.

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd. .....Bath, Me.
Bell Engineering Works, David .....Buffalo.
Buffalo Forge Co. .....Buffalo.
Chicago Ship Building Co.....Chicago.
Chase Machine Co. .....Cleveland.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co. .....Detroit
Fletcher, W. & A. Co. .....Hoboken, N. J.
Fore River Ship & Engine Co.....Quincy, Mass.
Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated.....New York.
Great Lakes Engineering Works.....Detroit, Mich.
Hall Bros. .....Philadelphia.
Harlan & Hollingsworth Co. ....Wilmington, Del.
Jenks Ship Building Co. .....Port Huron, Mich.
Lake Shore Engine Works .....Marquette, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
Marine Iron Works.....Chicago.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Mosher, Chas. D. .....New York.
Neafie & Levy Ship & Engine Bldg. Co. Philadelphia.
Newport News Ship Building Co. Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Thropp, J. E. & Sons Co. .....Trenton, N. J.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Trigg, Wm. R. Co.....Richmond, Va.
Trout, H. G. .....Buffalo.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son .....New York.
Electro-Dynamic Co. .....Philadelphia.
Detroit Electric Signal Co. .....Detroit.
MacLean Hydraulic Signal Co. .....Chicago.
Seidler-Miner Electric Co. .....Detroit.

ENGINEERING BOOKS.

Audel & Co., Theo. .....New York.
Marine Review Pub. Co. .....Cleveland.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co. .....Chicago.
Farnan Brass Works .....Cleveland.
Kieley & Mueller .....New York.
McCutcheon, C. H. .....Buffalo.
Reilly Repair & Supply Co., James.....New York.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Electro-Dynamic Co. .....Philadelphia.
Garrett-Cromwell Engineering Co. .....Cleveland.
Gaskin, Edward .....Buffalo.
Goodenough, Walter .....New York.
Hunt, Robt. W. & Co. .....Chicago.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas D. .....New York.
Newman, R. L. .....New York.
Pittsburg Testing Laboratory, Ltd. .....Pittsburg.
Powell, Ambrose V. .....Chicago.
Roelker, H. B. .....New York.
Sadler, Perkins & Field .....New York.
See, Horace .....New York.
Wood, W. J. .....Chicago.

EVAPORATING AND DISTILLING APPARATUS.

Reilly Repair & Supply Co., James....New York.

FANS FOR VENTILATION, EXHAUST, ETC.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

FEED WATER PURIFIERS AND HEATERS.

Learmonth, Robert .....Buffalo.
Reilly Repair & Supply Co., James.....New York.
Ross Valve Co. .....Troy, N. Y.

FIXTURES FOR LAMPS, OIL AND ELECTRIC.

General Electric Co. .....Schenectady, N. Y.
Page Bros. & Co. .....Boston.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

FORGES.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co. .....Cleveland.
Fore River Ship & Engine Co. .....Quincy, Mass.
Macbeth Iron Co. .....Cleveland.

FLUE WELDING.

Fix's, S. Sons .....Cleveland.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.

Castner, Curran & Bullitt (Pocahontas) ....Phila.
Graham Coal & Coke Co.....Detroit
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.
Smith, Stanley B. & Co. .....Detroit.
Youghiogheny & Lehigh Valley Coal Co...Chicago.

GAS BUOYS.

Safety Car Heating & Lighting Co. ..New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co. .....Cleveland.
Lake Shore Engine Works.....Marquette, Mich.

GAGES, STEAM AND VACUUM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

GRAPHITE.

Dixon Crucible Co., Joseph .....Jersey City, N. J.

HAMMERS, STEAM.

Bell Engineering Works, David .....Buffalo.
Chase Machine Co. .....Cleveland.
Q. & C. Co. .....Chicago.

HARDWARE, SHIP.

Topky Brothers .....Ashtabula, O.

HATCH GEARS.

"Long-Arm" System Co. .....Cleveland.

HEATING APPARATUS.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

HOISTS FOR CARGO, ETC.

American Ship Building Co. .....Cleveland.
Brown Hoisting Machinery Co., Inc. ....Cleveland.
Chase Machine Co. .....Cleveland.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....New York.
Hyde Windlass Co. .....Bath, Me.
Lidgerwood Mfg. Co. .....New York.
Marine Iron Co. .....Bay City.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE FITTINGS.

Farnan Brass Works. .....Cleveland.

HYDRAULIC MACHINERY.

Watson-Stillman Co., The.....New York.
Wood & Co., R. D. .....Philadelphia.

ICE MACHINERY.

American Linde Refrigerating Co. .....New York.
Roelker, H. B. .....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

INJECTORS.

Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co. .....Detroit, Mich.

INSURANCE, MARINE.

Brown & Co. .....Buffalo.
Brown, W. W. .....Cleveland.
Dunham, R. J. .....Chicago.
Elphicke, C. W. & Co. .....Chicago.
Hawgood & Co., W. A. .....Cleveland.
Hutchinson & Co. .....Cleveland.
Insurance Co. of North America....Philadelphia
McCarthy, T. R. .....Montreal.
McCurdy, Geo. L. .....Chicago.
Mitchell & Co. .....Cleveland.
Peck, Chas. E. & W. F. ...New York and Chicago.
Richardson, W. C. .....Cleveland.
Sullivan, D. & Co. .....Chicago.
Weeks, F. H. .....New York.

IRON ORE AND PIG IRON.

Bourne-Fuller Co. .....Cleveland.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Gas Engine & Power Co. .....New York.
Marine Construction & D. D. Co. .....Mariner's Harbor, S. I., N. Y.
Marine Iron Works.....Chicago.
Warrington Iron Works .....Chicago.
Willard, Chas. P. .....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co. .....Pittsburg.
Drein, Thos. & Son .....Wilmington, Del.
Kahnweiler's Sons, D. .....New York.
Lane & DeGroot .....Long Island City, N. Y.
Marine Construction & D. D. Co, Mariner's Harbor, ...S. I. N. Y.

LIGHTS, SIDE AND SIGNAL.

Helvig, H. A. J. .....New York.
Page Bros. & Co. .....Boston.
Russell & Watson .....Buffalo.

LOGS.

Walker & Sons, Thomas .....Birmingham, Eng.
Nicholson Ship Log Co. .....Cleveland.
Also Ship Chandlers.

MACHINISTS.

Chase Machine Co. .....Cleveland.
Macbeth Iron Co. .....Cleveland.
Union Machine & Boiler Co. .....Cleveland.
Ward Machine Co. .....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc. .....Philadelphia.

MACHINERY, NEW AND SECOND HAND.

Bowler & Co. Geo. H. .....Cleveland.
Clyde Machine Works. .....Chicago.

MAN-HOLES, SWING DOORS, ETC.

"Long-Arm" System Co. .....Cleveland.

MARINE RAILWAYS, BUILDERS OF

Crandall & Son, H. I. .....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W. .....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co. .....Cleveland
Bloomsburg & Co., H. .....Baltimore, Md.
Buffalo Forge Co. .....Buffalo.
Detroit Ship Building Co. .....Detroit.
Steam Boiler Equipment Co. .....New York.
Sturtevant, B. F. Co. .....Boston.

METALLIC PACKING.

Allen, Joseph .....Collingswood, N. J.
Hayden Mfg. Co., N. L. .....Columbus, O.
Katzenstein, L. & Co. .....New York.
U. S. Metallic Packing Co. .....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co. .....Boston.

MOTORS, GENERATORS—ELECTRIC.

Buffalo Forge Co. .....Buffalo.
Electro-Dynamic Co. .....Philadelphia.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
"Long-Arm" System Co. .....Cleveland.
Seidler-Miner Electric Co. .....Detroit.
Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co. .....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons .....Brookline, Mass.

NAVAL ARCHITECTS.

Gaskin, Edward .....Buffalo.
Goodenough, Walter .....New York.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas. D. .....New York.
Newman, R. L. .....New York.
Sadler, Perkins & Field .....New York
See, Horace .....New York.
Wood, W. J. .....Chicago.

OAKUM.

DeGrauw, Aymar & Co. .....New York.
Stratford Oakum Co., ...Jersey City, N. J.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph .....Jersey City, N. J.
Standard Oil Co. .....Cleveland.

OIL FILTERS.

Haines Co., W. S. .....Philadelphia.

PACKING.

Allen, Joseph .....Collingswood, N. J.
Crane Co. .....Chicago.
Hayden Mfg. Co., N. L. .....Columbus, O.
Jenkins Bros. .....New York.
Katzenstein, L. & Co. .....New York.
United States Metallic Packing Co. ....Philadelphia.

PAINTS.

Baker, Howard H. & Co. .....Buffalo.
Berry Bros., Ltd. .....Detroit.
Day's Varnish & Dryer Co. .....Cleveland.
Mohawk Paint & Chemical Co. .....New York.
New Jersey Zinc Co. .....New York.
Topky Brothers .....Ashtabula, O.
Upson-Walton Co. .....Cleveland.

PATENT ATTORNEYS.

Thurston & Bates .....Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PIPE—BRASS AND COPPER, IRON PIPE SIZE.

Waterbury Brass Co. .....New York.

PIPE, WROUGHT IRON.

Bourne-Fuller Co .....Cleveland.
Crane Co .....Chicago.
Macbeth Iron Co. .....Cleveland.

PIPE, CAST IRON.

Wood & Co., R. D. .....Philadelphia.

PLANING MILL MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PLATE BENDING AND PLANING MACHINES.

Wood & Co., R. D. .....Philadelphia.

PLUMBING, MARINE.

Mott, J. L., Iron Works .....New York.
Reilly Repair & Supply Co., James....New York.
Sands, Alfred B. & Son .....New York.

PNEUMATIC TOOLS.

Allen, John F., ...New York.
Chicago Pneumatic Tool Co. .....Chicago.
Q. & C. Co. .....Chicago.

POLISH FOR METALS.

Bertram's Oil Polish Co. .....Boston.

POWER DOORS AND HATCHES.

"Long-Arm" System Co. .....Cleveland.

PRESSURE REGULATORS.

Kieley & Mueller .....New York
Ross Valve Co. .....Troy, N. Y.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

PROPELLER WHEELS.

American Ship Building Co. .....Cleveland
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building & Dry Dock Co. Baltimore.
Bath Iron Works, Ltd. .....Bath, Me.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co. .....Bath, Me.
Harlan & Hollingsworth Co.....Wilmington, Del.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
Macbeth Iron Co..... Cleveland.
MacKinnon Mfg. Co. .....Bay City, Mich.
Marine Iron Works .....Chicago.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co...Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Phosphor Bronze Smelting Co., Ltd...Philadelphia.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roelker, H. B. .....New York.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp & Sons Co., J. E. .....Trenton, N. J.
Trigg, Wm. R. Co. .....Richmond, Va.
Trout, H. G. .....Buffalo.

PROJECTORS, ELECTRIC.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F. Mfg. Co. .....New York.
Clyde Machine Works ....Chicago.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Wks. Oswego, N. Y.
Wood, R. D. & Co. .....Philadelphia.

PUNCHES, RIVETERS, SHEARS.

Chicago Pneumatic Tool Co. .....Chicago.
Wood, R. D. & Co. .....Philadelphia.

REFRIGERATING APPARATUS.

Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping.New York.

RELEASING HOOKS FOR DETACHING BOATS.

Standard Automatic Releasing Hook Co. New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co. .....Cleveland.

RANGES.

Russell & Watson .....Buffalo.

RIVETS—BRASS AND COPPER.

Waterbury Brass Co.....New York.

RUBBER INSULATED WIRES.

Roebling's Sons, Jno. A...New York and Cleveland.

SAFETY VALVES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co.....Boston.
Hayden Mfg. Co., N. L..... Columbus, O.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co. .....Buffalo.
Upson-Walton Co. .....Cleveland.
Wilson & Silsby .....Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SCHOOLS—NAUTICAL, ENGINEERING.

Buffalo Com. & Electro-Mechanical Inst...Buffalo.
Chicago Nautical School .....Chicago.
Capt. S. W. Gould.....Cleveland.

SEARCH LIGHTS.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co. .....Cleveland.

SHIP BUILDERS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building & Dry Dock Co..Baltimore.
Bath Iron Works, Ltd.....Bath, Me.
Bell Engineering Works, David .....Buffalo.
Buffalo Dry Dock Co. .....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co. .....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Harlan & Hollingsworth Co. .....Wilmington, Del.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.
Marine Iron Works .....Chicago.
Maryland Steel Co .....Sparrow's Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co....Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Smith & Son, Abram .....Algonac, Mich.
Superior Ship Building Co.....Superior, Wis.
Trigg, Wm. R. Co. .....Richmond, Va.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co. .....Buffalo.
Moran Bros. Co. .....Seattle, Wash.
Reilly Repair & Supply Co., James....New York.
Upson-Walton Co. .....Cleveland.

SHIP LANTERNS AND LAMPS.

Helvig, H. A. J.....New York.
Page Bros. & Co.....New York.
Russell & Watson.....Buffalo.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

SPARS—LARGE SIZES.

Moran Bros. Co.....Seattle, Wash.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
Holmes, Samuel.....New York.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal, Can.
Newman, R. L.....New York.
Weeks, F. H.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
International Nav. Co.....Philadelphia.
Pere Marquette R. R. & S. S. Line.....Milwaukee.
Red Star Line.....New York.

STEEL CASTINGS.

Seaboard Steel Casting Co.....Chester, Pa.
Macbeth Iron Co..... Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co. .....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Shipbuilding Co.....Detroit.
Electro-Dynamic Co.....Philadelphia.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Queen City Engineering Co.....Buffalo.
Sheriff Mnfg. Co.....Milwaukee.

STOCKS, BONDS, SECURITIES.

Brown, W. W.....Cleveland.
Fahey & Co.....Cleveland.

SUBMARINE DIVING APPARATUS

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Goodenough, Walter.....New York.
Gaskin, Edward.....Buffalo.
Newman, R. L.....New York.
See, Horace.....New York.
Wood, W. J.....Chicago.

TESTS OF MATERIAL.

Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F. ....New York.
Chicago Pneumatic Tool Co.....Chicago.
Q. & C. Co.....Chicago.
Watson-Stillman Co.....New York.
Wood, R. D. & Co.....Philadelphia.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Lake Shore Stone Co.....Milwaukee.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.
Sincennes-McNaughton Line, Ltd....Montreal, Can.

TRAPS, STEAM.

Haines Co., Wm. S.....Philadelphia.
Kieley & Mueller.....New York.

TRUCKS.

Boston & Lockport Block Co..... .....Boston.

TUBING, SEAMLESS.

Benedict & Burnham Mnfg. Co....Waterbury, Conn.
National Tube Co.....Pittsburg.
Waterbury Brass Co.....New York.

VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Crane Co. .....Chicago.
Farnan Brass Works .....Cleveland.
Hayden Mfg. Co., N. L. .....Columbus, O.
Jenkins Bros.....New York.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
Ross Valve Co. .....Troy, N. Y.

VALVES FOR WATER AND GAS.

Wood & Co., R. D.....Philadelphia.
Ross Valve Co. .....Troy, N. Y.

VARNISHES.

Berry Brothers, Ltd.....Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VESSEL CASTINGS.

American Ship Building Co..... .... Cleveland.
Macbeth Iron Co..... Cleveland.

VESSEL AND FREIGHT AGENTS.

Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Brown, W. W.....Cleveland.
Dunham, R J..... .....Chicago.
Elwell, Jas. W. & Co.....New York.
Elphicke, C. W & Co.....Chicago.
Hall & Root.....Buffalo.
Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel.....New York.
Hutchinson & Co.....Cleveland.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal.
Newman, R. L.....New York.
Mitchell & Co.....Cleveland.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Weeks, F. H.....New York.

VENTILATING APPARATUS FOR SHIPS.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co.....Boston.

WIRE—BRASS AND COPPER.

Waterbury Brass Co.....New York.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co. .....New York
Roebling's Sons John A....New York and Cleveland.
Upson-Walton Co.....Cleveland.

WHISTLES, STEAM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Farnan Brass Works .....Cleveland.
Lunkenheimer Co.....Cincinnati.

WHITE METAL—SHEETS, RODS AND WIRE.

Waterbury Brass Co.....New York.

WINDLASSES.

American Ship Windlass Co.....Providence, R. I.
American Ship Building Co. .....Cleveland
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.

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American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co.....Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Lake Shore Stone Co.....Milwaukee.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

YACHT AND BOAT BUILDERS.

Bell Engineering Works, David .....Buffalo.
Drein, Thos. & Son.....Wilmington, Del.
Gas Engine & Power Co..... New York.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & Dry Dock Co. ...New York.
Marine Iron Works.....Chicago.
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No. 20, Chi & Cleve Ex....	*7:20am	.....
No. 28, N Y & Bost Ex....	*7:40am	*8:00am
No. 40, Toledo & Buff Ac.	†10:00am	†10:40am
No. 32, Fast Mail	*11:25am	*11:30am
No. 44, Ac via Sandusky..	†1:40pm	..
No. 46, Southwestern Ex.	....	*3:00pm
No. 106, Conneaut Accom	.....	†4:30pm
No. 6, Lim Fast Mail....	*5:40pm	*5:45pm
No. 26, 20th Cent Lim....	*7:40pm	*7:43pm
No. 10, C., N Y & B Sp....	*7:30pm	*7:50pm
No. 16, New Eng Ex.....	*10:30pm	*10:35pm
No. 2, Day Express.....	†9:10pm	†9 25pm
No. 126, Norwalk Accom.	†7:50am	.....

Westward.	Arrive from East.	Depart West.
No. 11, Southwestern Lim	*3:25am	.....
No. 7, Day Express.....	.....	†6:10am
No. 15, Bost & Chi Sp.....	*3:10am	*3:15am
No. 19, Lake Shore Lim..	*7:15am	*7:20am
No. 23, Western Express.	*10:30am	*10:35am
No. 33, Southern Express	*12:25pm	....
No. 133, Cleve & Det Ex..	.....	*12:45pm
No. 47, Accomodation.....	†11.20am	†3:00pm
No. 141, Sandusky Accom.	.....	†3:10pm
No. 43, Fast Mail	*4:35pm	*4:40pm
No. 127, Norwalk Accom..	.....	†5:10pm
No. 37, Pacific Express...	*7:00pm	*7:20pm
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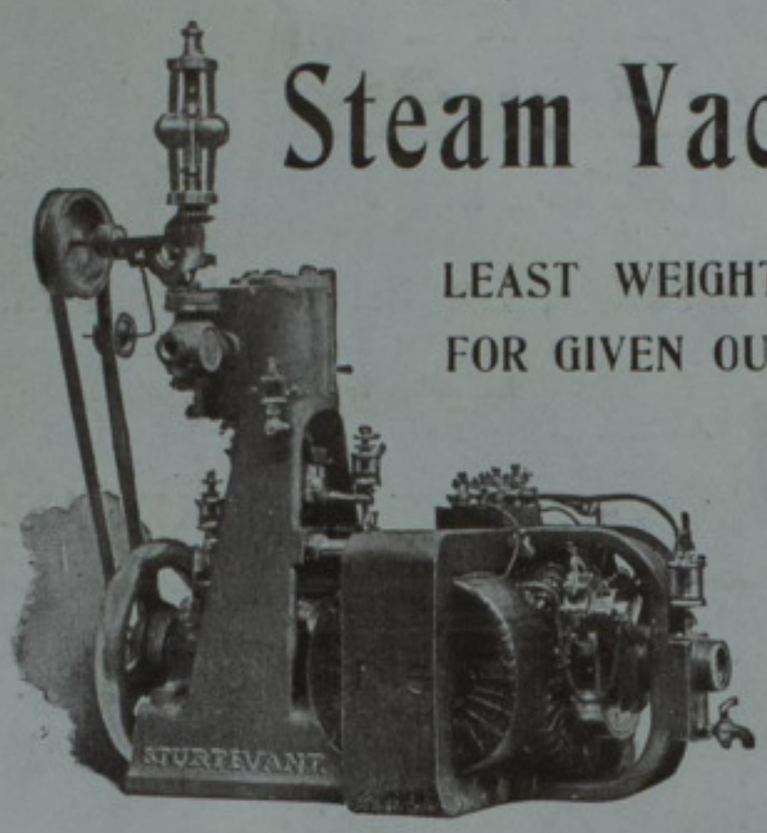

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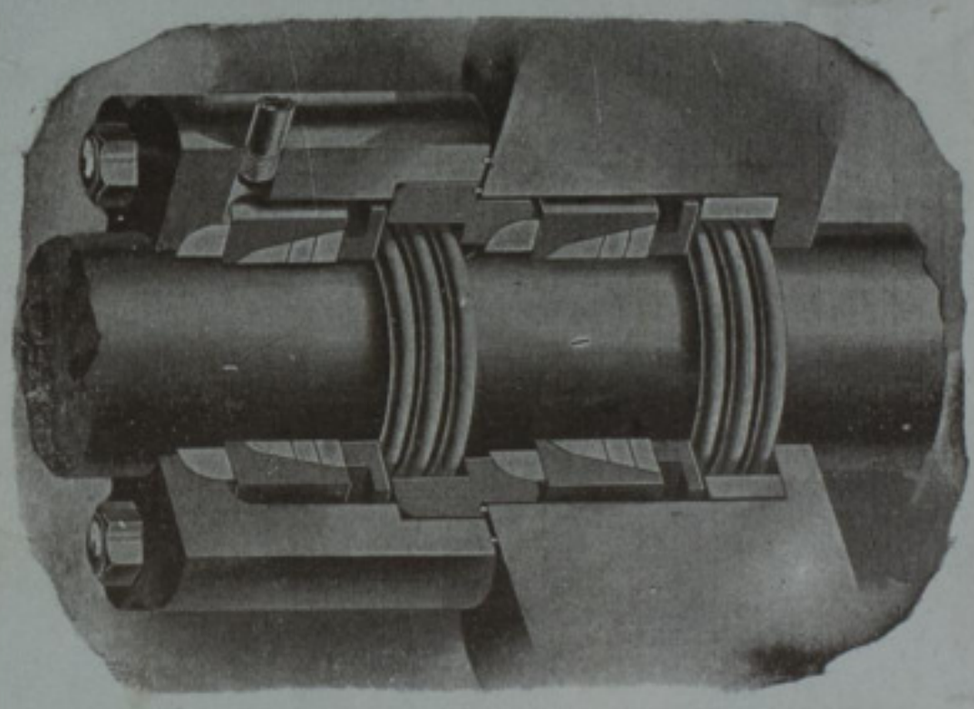

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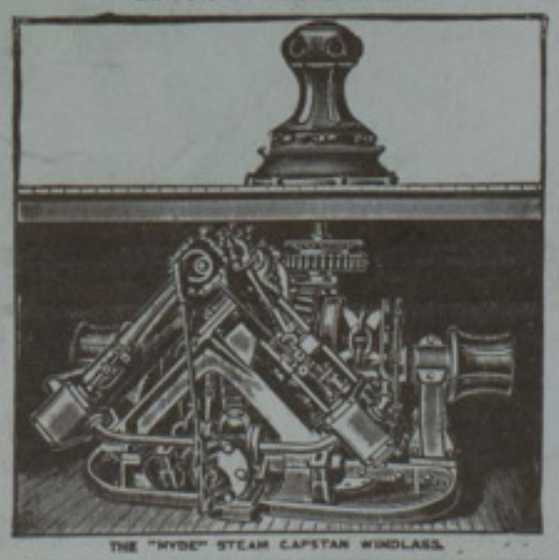

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WEEKLY.] AND MARINE RECORD. [ESTABLISHED, 1878.

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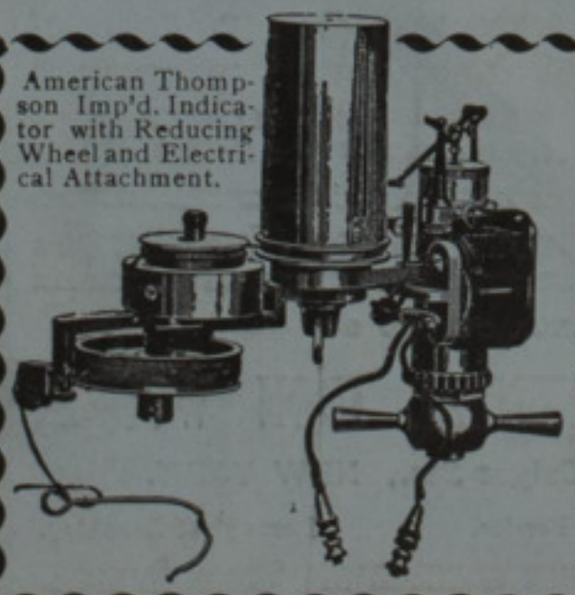

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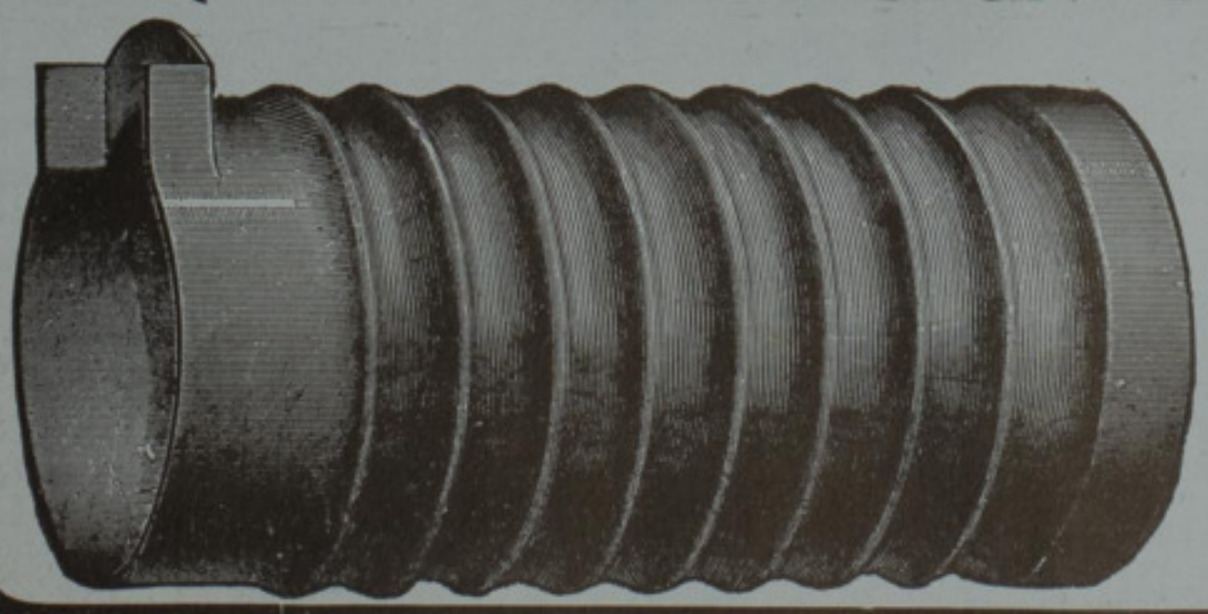

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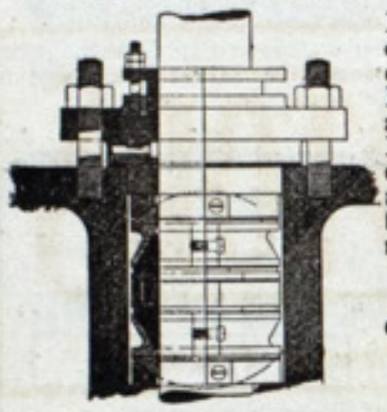

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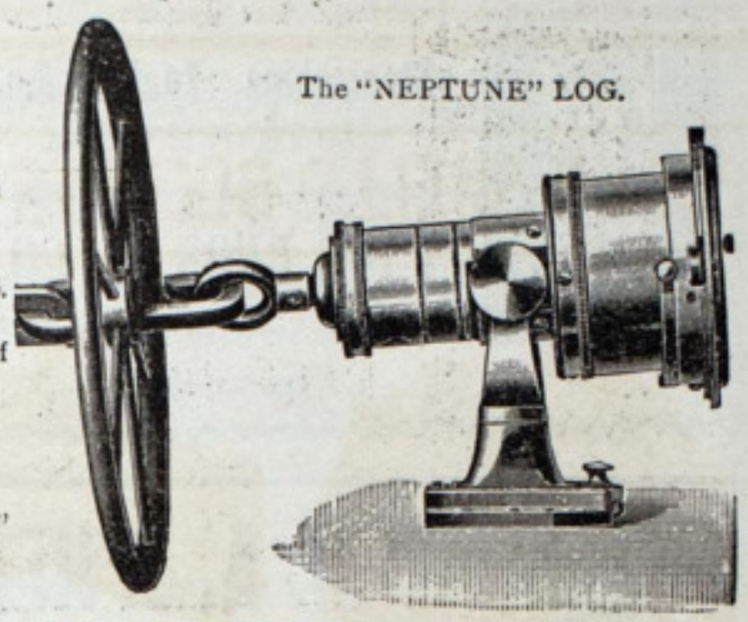

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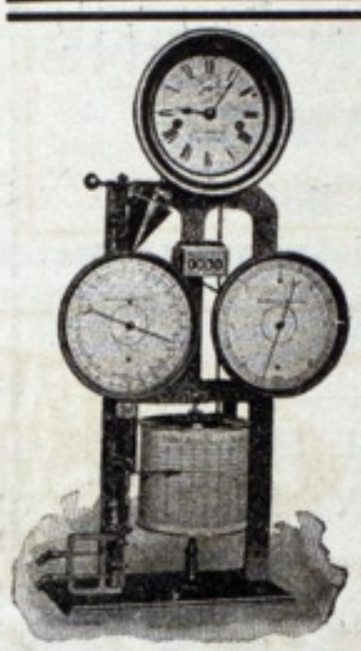

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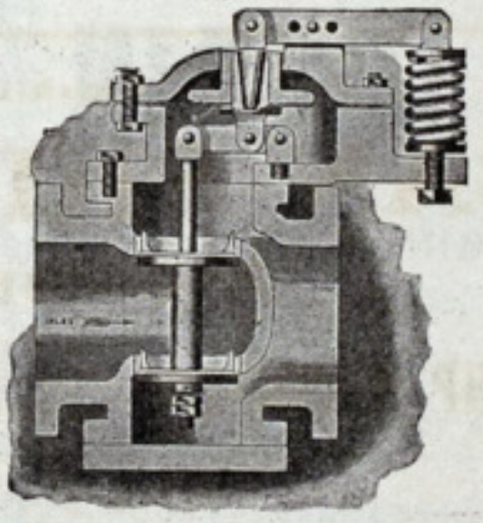

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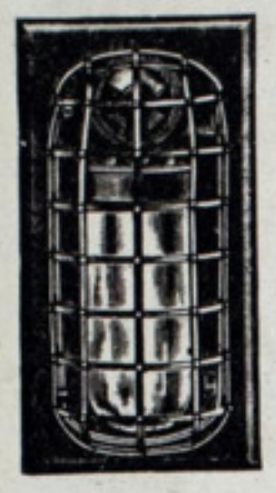

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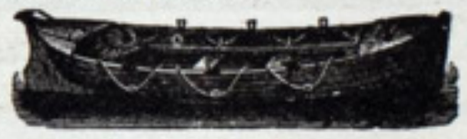

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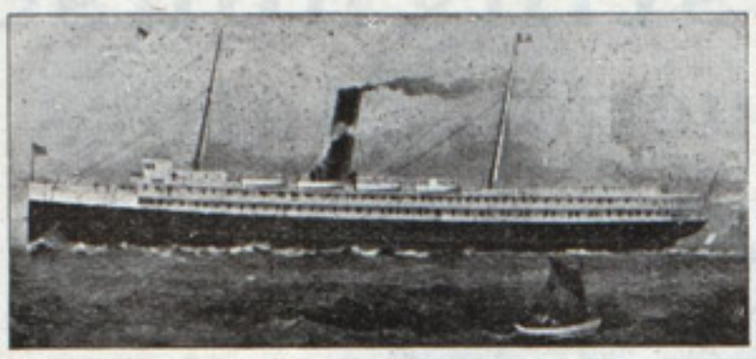

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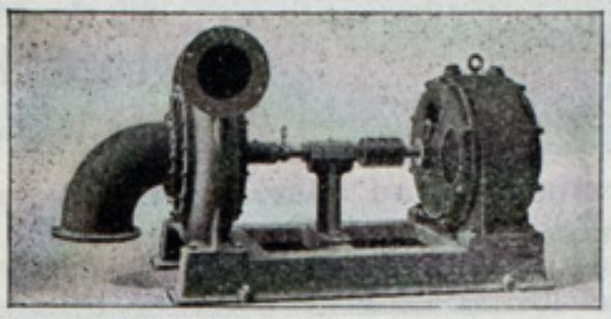

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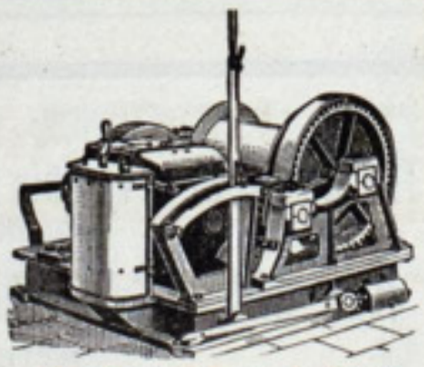

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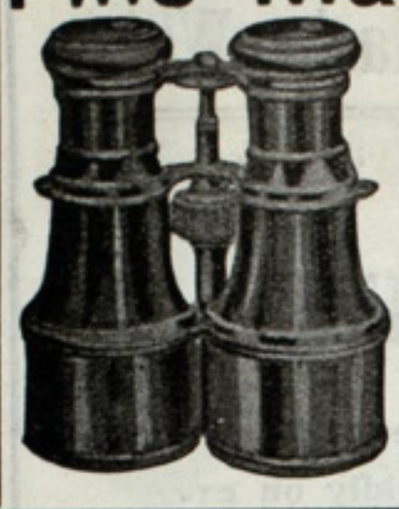

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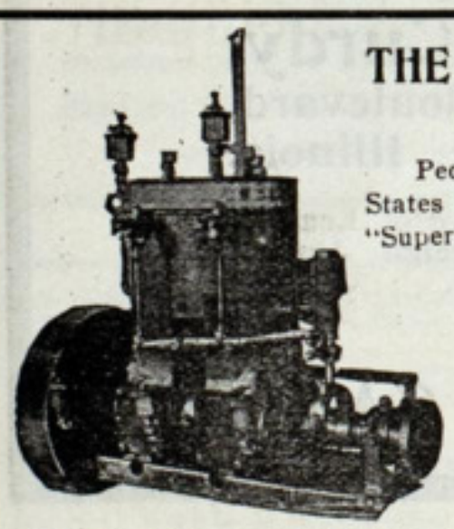

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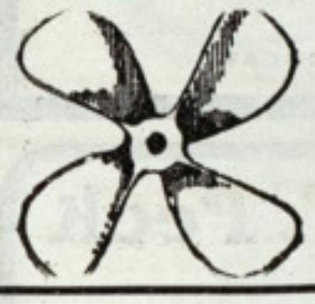

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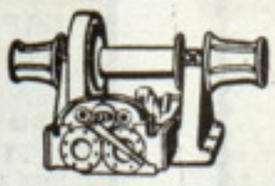

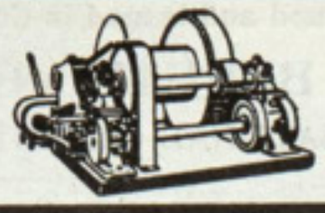

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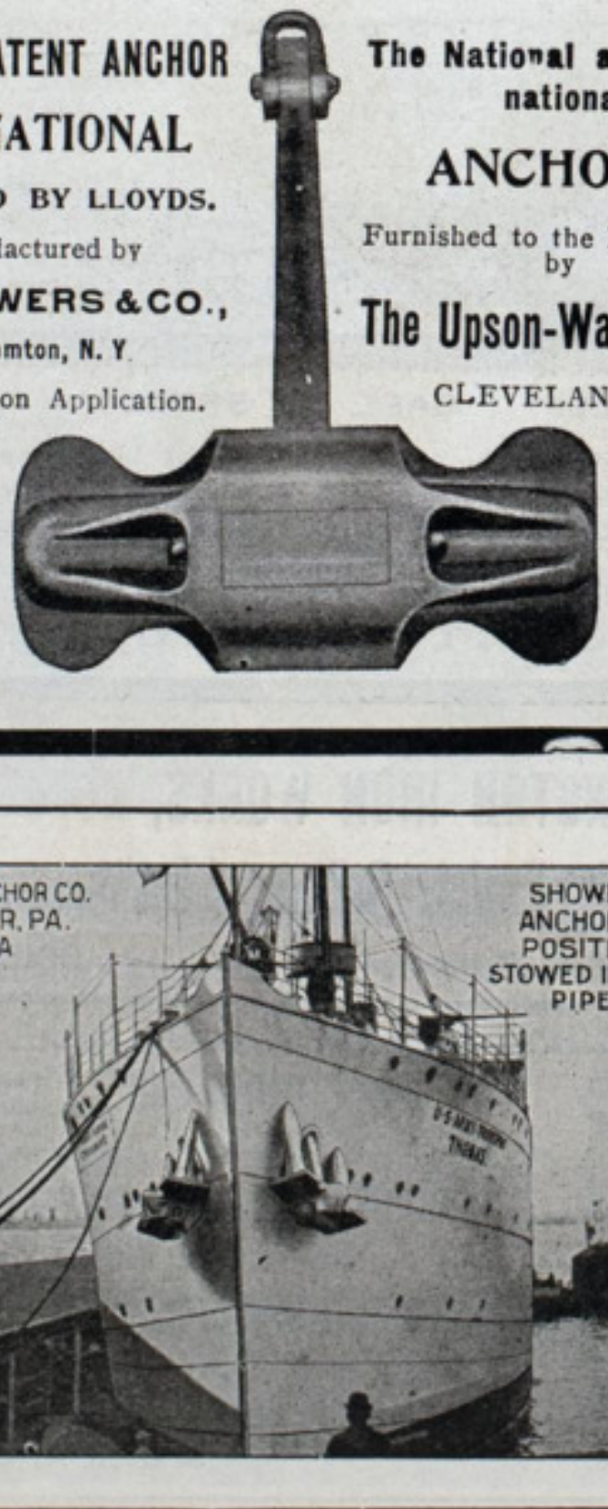

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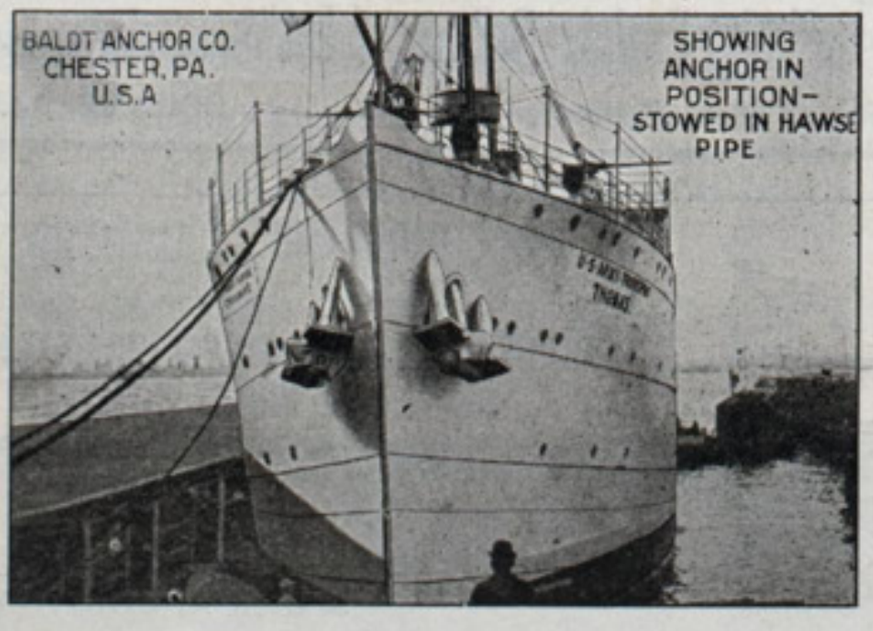

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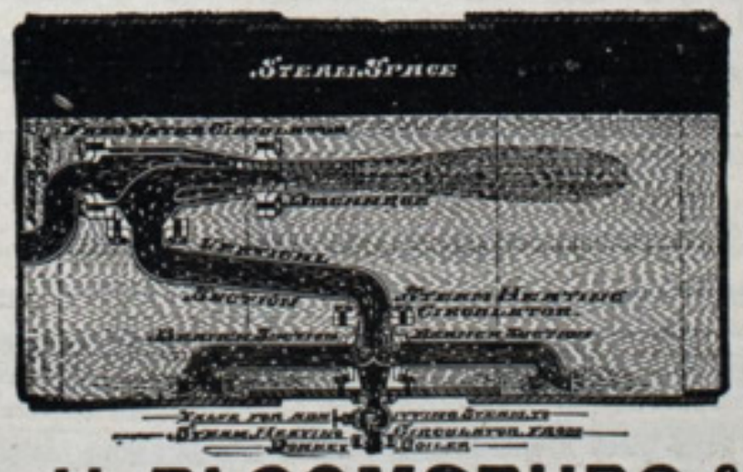

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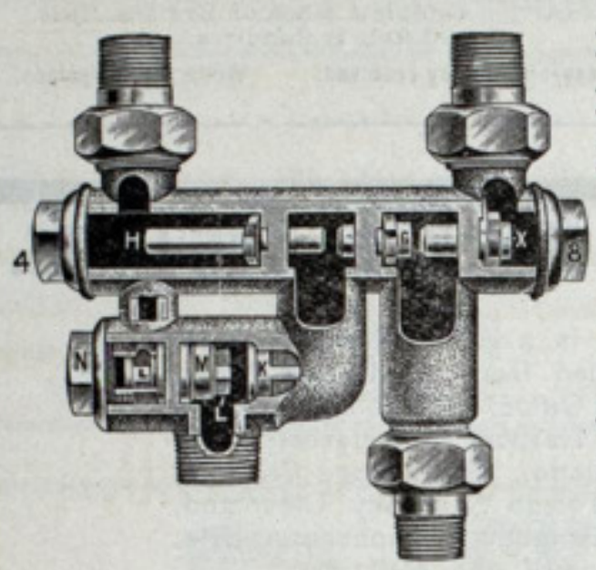

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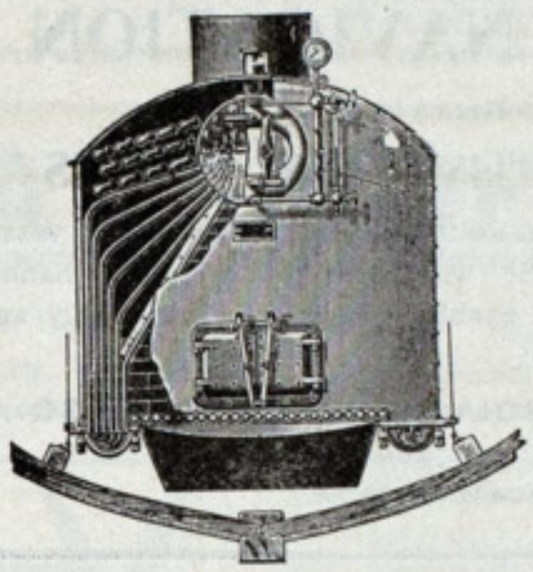

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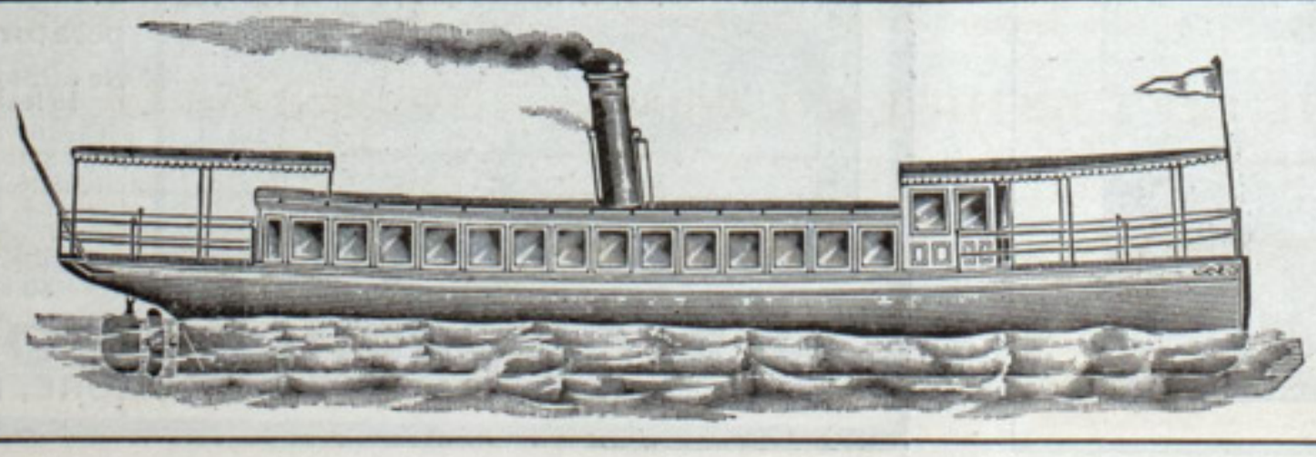

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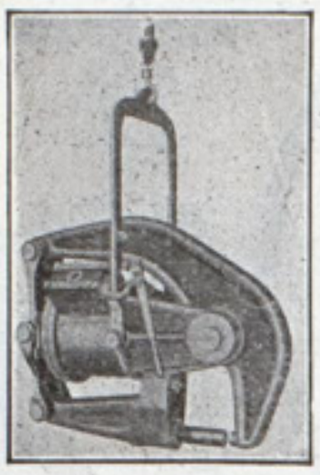

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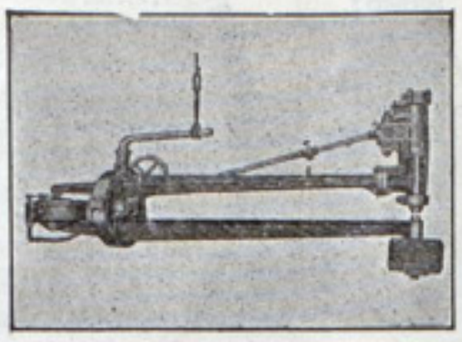

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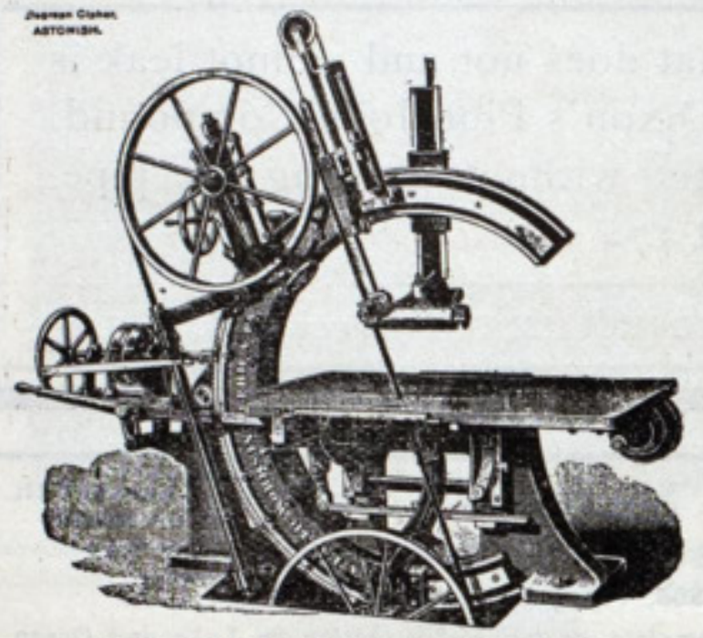

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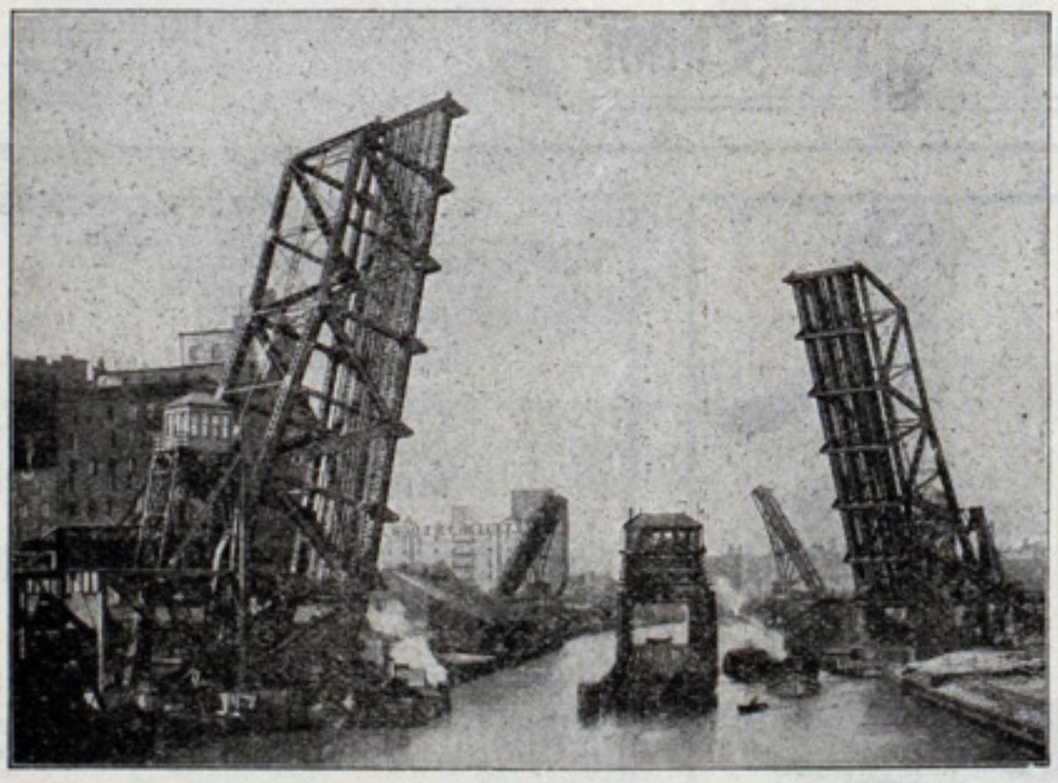

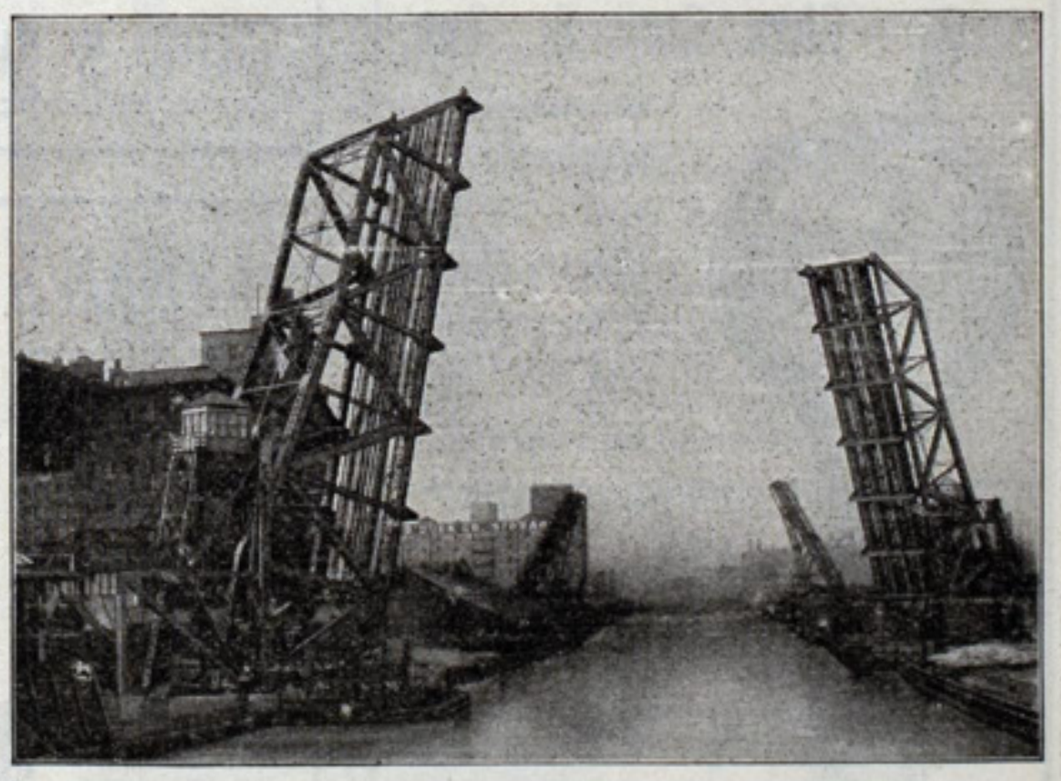

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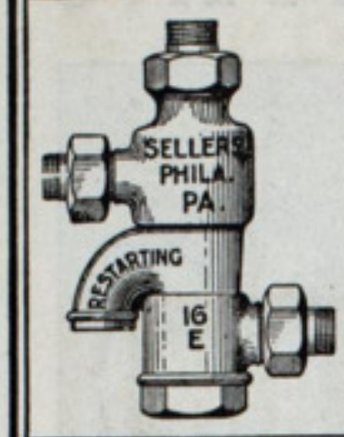

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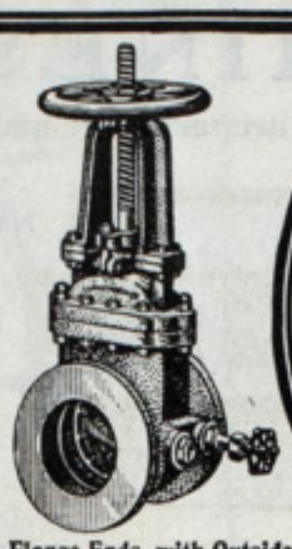

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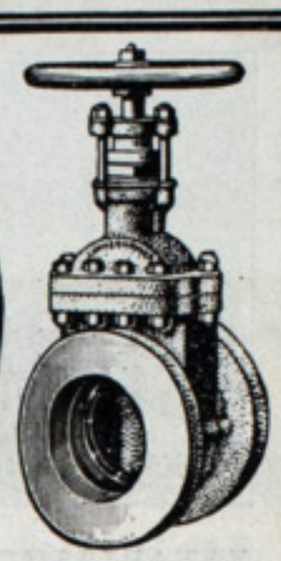

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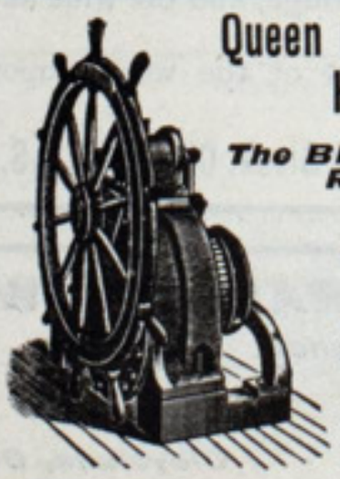

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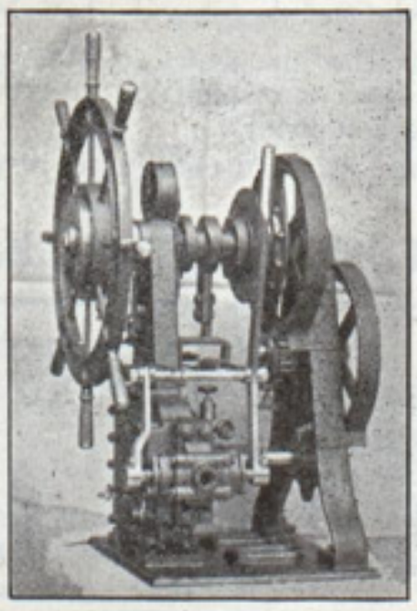

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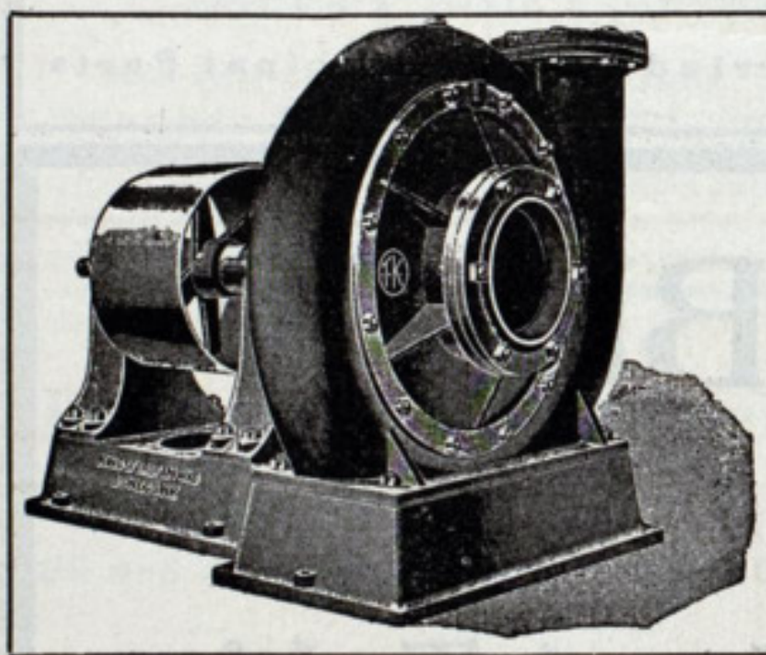

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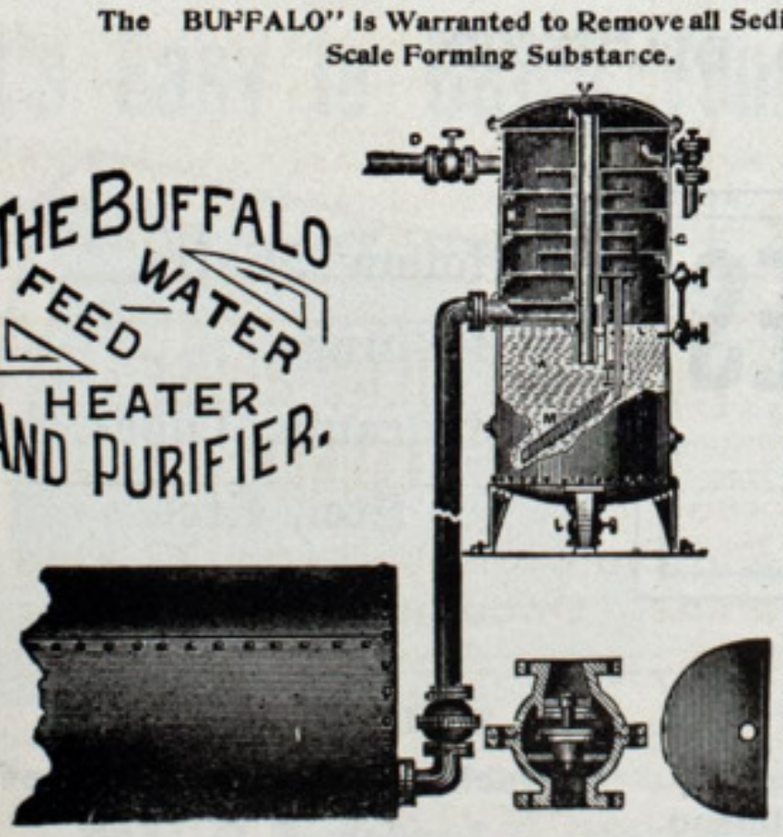

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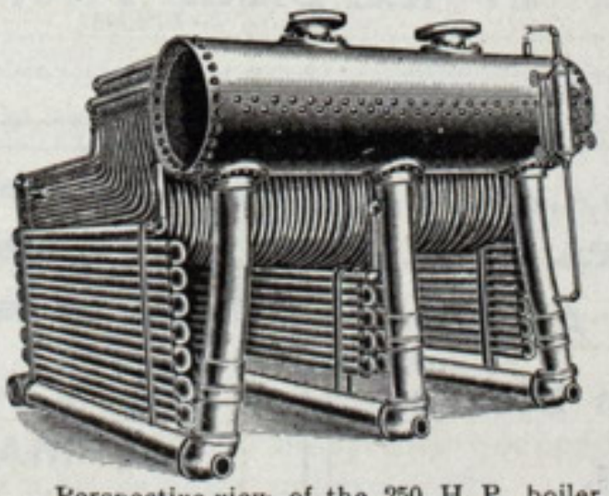

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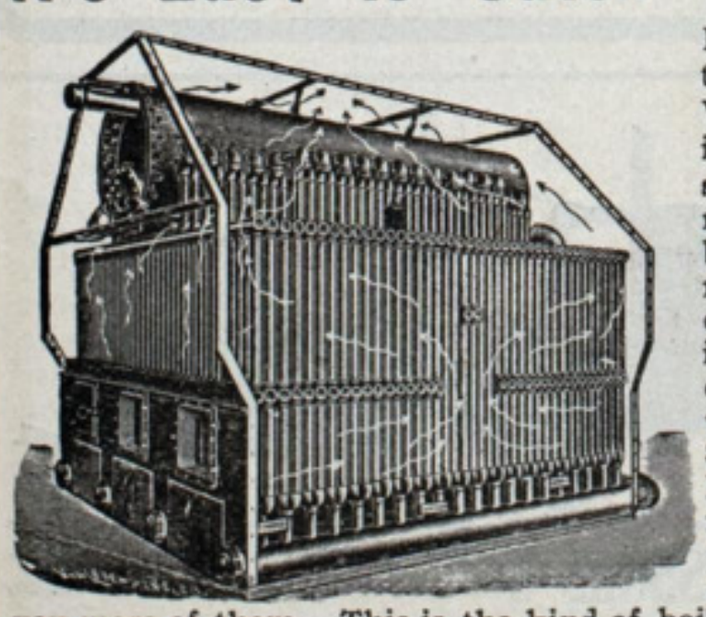

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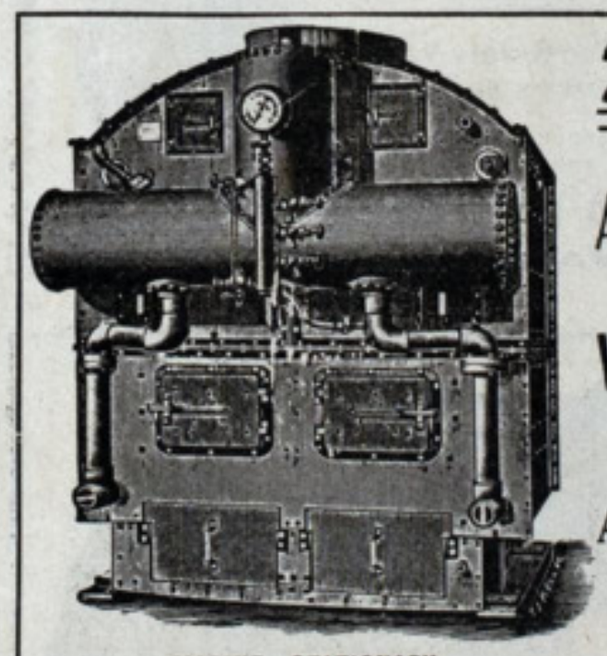

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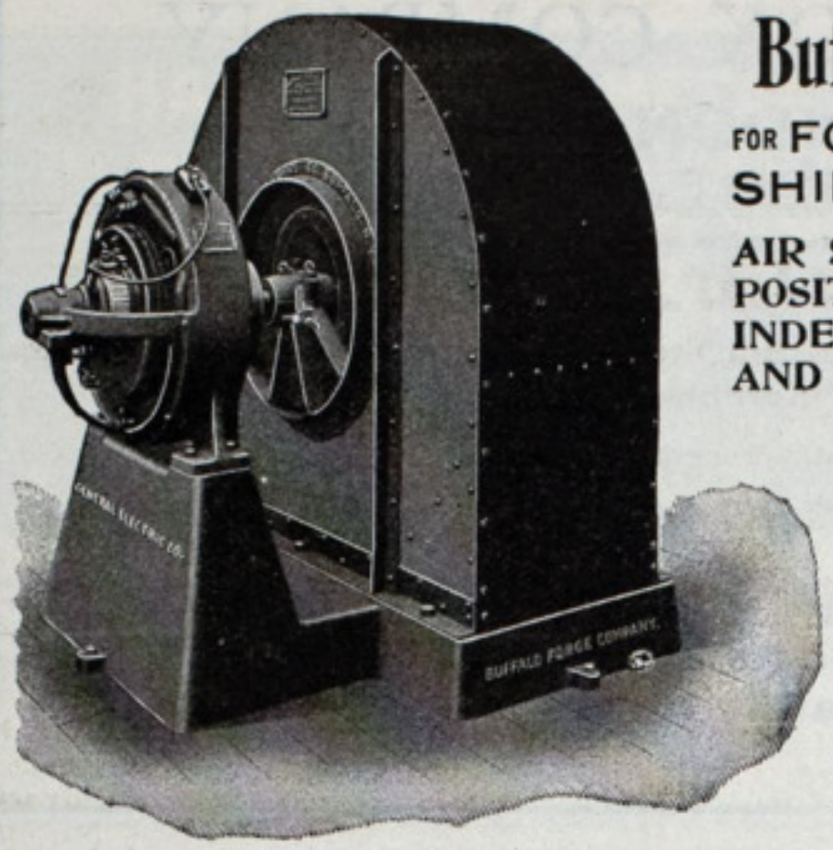

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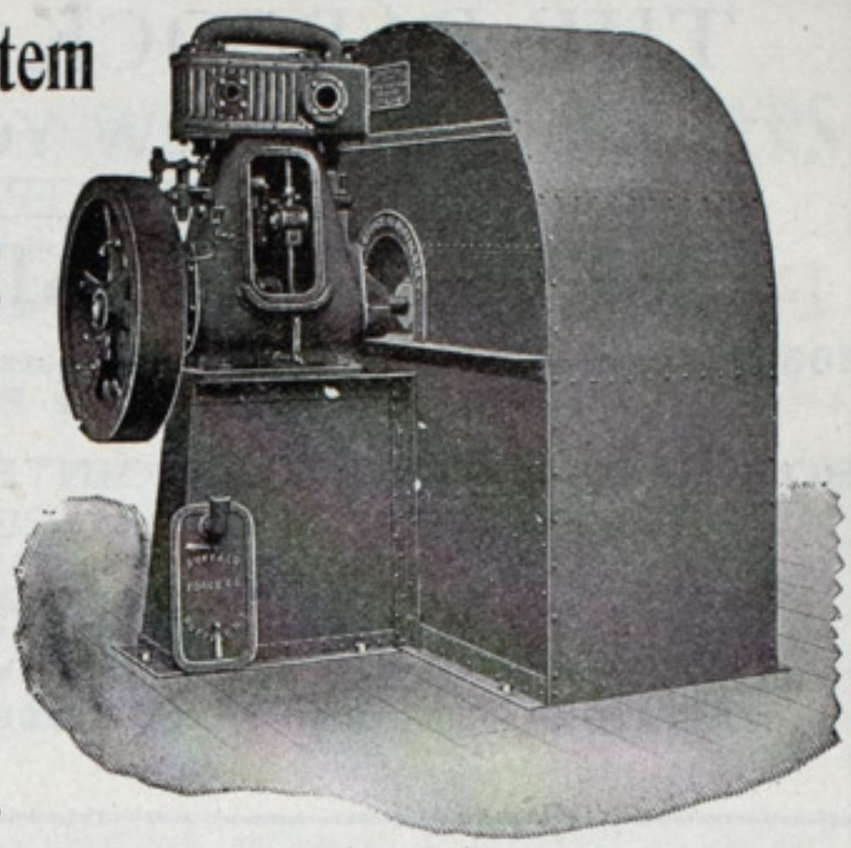

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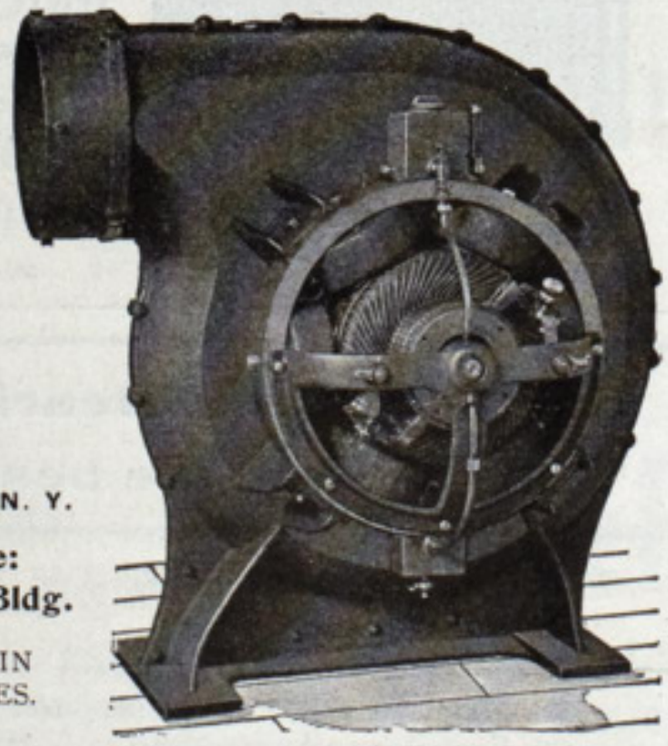

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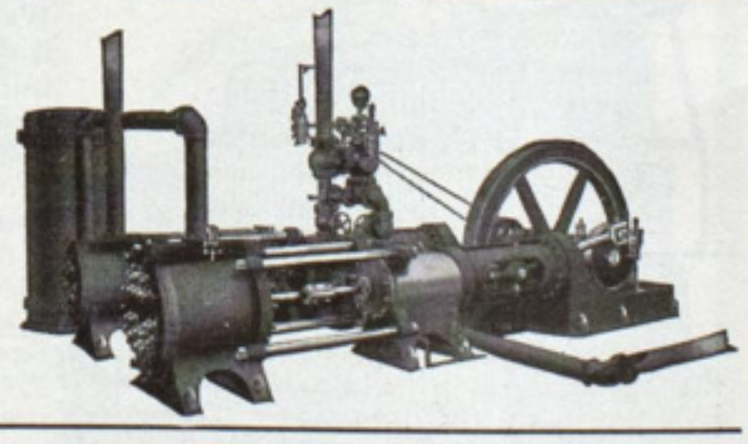

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